

American River Watershed

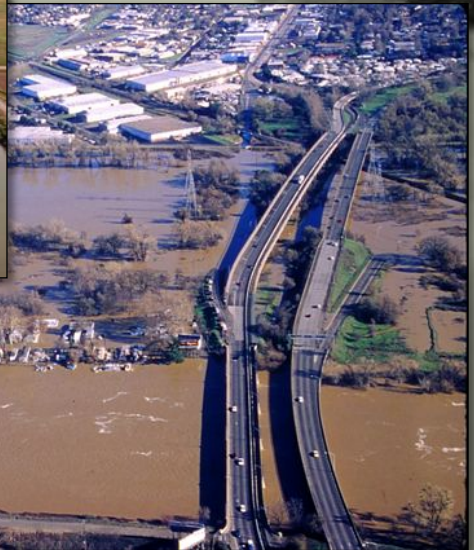
Common Features

General Reevaluation Report

Appendix D

Real Estate Plan

December 2015



*Cover Photos courtesy of the Sacramento District:
Sacramento Weir during operation
Sacramento River facing south near the Pocket and Little Pocket neighborhoods
High flows on the American River at the Highway 160 overcrossing
Folsom Dam releasing high flows*

**AMERICAN RIVER, CALIFORNIA
COMMON FEATURES PROJECT
GENERAL REEVALUATION REPORT**

Real Estate Plan

**U.S. Army Corps of Engineers
Sacramento District**

December 2015

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REAL ESTATE PLAN
For
American River Watershed
Common Features
General Reevaluation Report
Sacramento and Sutter Counties, California

1. Statement of Purpose

This Real Estate Plan (REP) is intended to support and present the real estate requirements for a general reevaluation study of the authorized American River Common Features Project (ARCF) and is for planning purposes only. Studies that were completed prior to this reevaluation report include the following: Congress directed the Corps to investigate additional means to reduce flood risk to the City of Sacramento following the flood of 1986. The Corps completed a feasibility study in 1991, recommending a concrete gravity flood detention dam at the Auburn Dam site and levee improvements downstream of Folsom Dam. Congress directed the Corps to conduct supplemental analysis of the flood control options considered in the 1991 study. The resulting *Supplemental Information Report, American River Watershed Project, California* (March 1996) recommended a similar combination of a gravity flood detention dam at the Auburn Dam site with downstream levee work. It considered, but did not advance, plans for Folsom Dam improvements and a stepped release plan for Folsom Dam accompanied by downstream levee improvements. Congress recognized that levee improvements were “common” to all candidate plans in the report and that there was a Federal interest in participating in these “common features”. Thus, the American River Common Features Project was authorized in Water Resource Development Act (WRDA) 1996 (Pub. L. 103-303, Section 101(a)(1)) and the decision on Auburn Dam was deferred. Major construction components for Common Features included construction of levee improvements to reduce seepage along approximately 22 miles of American River levees, and levee strengthening and the raising of 12 miles of the Sacramento River levee in the Natomas Basin. Meanwhile, improvements to other levees adjacent to the Natomas Basin were authorized in the Defense Appropriations Act of 1993 (Pub. L. 102-396, (HR 5504), Sec. 9159, 106 STAT. 1876, 1944-1946 (1992)). The Sacramento Area Flood Control Agency (SAFCA) constructed these latter improvements between 1995 and 1998.

In 1999, Congress authorized improvements to Folsom Dam to control a 200-year flood event with a peak release of 160,000 cubic feet per second. WRDA 1999 also authorized the Folsom Dam Modification Project to modify the existing outlets to allow for higher releases earlier in flood events. At the same time, Congress also directed the Corps to review additional modifications to the flood storage of Folsom Dam, indicating that Congress was looking at maximizing the use of Folsom Dam for flood damage reduction prior to consideration of any additional storage on the American River. The Folsom Dam Raise Project was subsequently authorized by Congress in 2004.

The Common Features project was modified by WRDA 1999 so that it could safely convey an emergency release of 160,000 cfs. These improvements included construction of slurry walls to reduce seepage and levee raises along four stretches of the American River, and construction of levee strengthening and raising of 5.5 miles of the Natomas Cross Canal levee in the Natomas Basin. Additional construction components for both WRDA 1996 and 1999 were authorized, and are described in Chapter 5 of main GRR document page 5-1.

All American River features authorized in WRDA 1996 and 1999 have been constructed by the Corps of Engineers or are in design analysis for construction within a year or two. Design and construction have been undertaken under a Project Cooperation Agreement with the California Reclamation Board (now known as the Central Valley Flood Protection Board (CVFPB)) executed July 13, 1998, and amended four times. Cost sharing for these features is 75% Federal and 25% non-Federal.

However, the Natomas Basin features authorized in WRDA 1996 and 1999 have been deferred. Following the flood of 1986, significant seepage was experienced on the Sacramento River from Verona (upstream end of Natomas) at River Mile (RM) 79 to Freeport at RM 45.5 and on both the north and south bank of the American River. Seepage on the Sacramento River was so extensive that soon after the 1986 flood event, Congress funded levee improvements as part of the Sacramento Urban Levee Improvement Project (Sac Urban). The Sac Urban Project constructed shallow seepage cutoff walls from Powerline Road in Natomas down to the town of Freeport. At the time, seepage through the levees was considered to be the only significant seepage problem affecting the City of Sacramento.

After construction of the Sac Urban project, the Sacramento Valley experienced a flood event in 1997. This led to a geotechnical evaluation of levees in the vicinity of the City of Sacramento which showed that deep underseepage was of concern. Considerable seepage occurred on the Sacramento River as well as on the American River. Seepage on the American River was expected because the levee improvements had not yet been constructed. However, the occurrence of significant seepage on the Sacramento River in the reach improved as part of the Sac Urban project confirmed that deep underseepage was a significant concern in this area, a conclusion later confirmed by the Levee Seepage Task Force in 2003.

Following the recognition of deep underseepage as a major concern, seepage reduction measures on the American River needed to be redesigned to reduce both through- and deep underseepage. The redesign led to considerable cost increases over what was originally authorized by Congress: increasing to \$91.9 million from the originally-authorized \$56 million under WRDA 1999, and to \$205 million under the Energy and Water Development Appropriations Act of 2004 (Pub. L. 108-137).

Because of the considerable cost increase of reducing the seepage problem on the American River, all funds appropriated by Congress for the project in the late 1990s and the early part of the 2000s were used for construction activities on the American River instead of for design efforts in the Natomas Basin. Combining this with the recognition that all work in the Natomas Basin would also require significantly more effort than was anticipated at the time of authorization, it was decided in 2002 that a reevaluation study would be required for the Common Features project. Congress was notified in 2004 that additional authorized cost increases would be required for study, design, and construction of levee improvements in the Natomas Basin.

While the reevaluation study was beginning for the Common Features project, the Folsom Dam Post Authorization Change report (PAC) was being completed by the Sacramento District. The results of this study, and of the follow-on Economic Reevaluation Report (ERR) for Folsom Dam improvements, showed that additional levee improvements were needed on the American River and on the Sacramento River below the American River in order to truly capture the benefits of the Folsom Dam projects. These levee problems consisted primarily of erosion concerns on the American River and seepage, stability, erosion, and overtopping problems on the Sacramento River below the confluence with the American River. However, the full extent of these levee problems was not known. Because of this, it was realized that additional reevaluation studies were also needed to include the two remaining basins comprising the City of Sacramento: American River North and American River South. The reevaluation began in 2006.

The project delivery team (PDT) for the ARCF GRR had completed the Feasibility Scoping Meeting (FSM) milestone and was working towards the Feasibility Review Conference milestone. However, in July 2009 the PDT was directed to complete an interim Post Authorization Change Report for the Natomas Basin (PACR) to receive consideration in a potential WRDA 2010. In December 2010, the Natomas Basin Post Authorization Change Report (PACR) and Interim General Reevaluation Report (GRR) was completed, which focused on the problems associated with the existing levees in the Natomas Basin. The interim GRR recommended improving levee performance by addressing seepage and stability problems, but did not address measures to raise the height of the levees. The Natomas Interim GRR has been forwarded to Congress for authorization.

The cost estimates of the real estate requirements necessary to support the various alternatives is discussed in detail in the 2014 ARCF GRR. All alternatives were screened out, with the exception of Alternative 1 Levee Improvements, the National Economic Development Plan and Alternative 2 Sacramento Bypass and Weir widening and Levee Improvements which is the Recommended Plan and locally preferred plan (LPP). This REP specifically identifies the real estate requirements in support of the Recommended Plan. There may be modifications to the project and its plans that occur during Preconstruction, Engineering and Design (PED) phase, thus changing the final acquisition area(s) and or/ administrative and land costs reflected in this REP.

2. Project Authority

The basic authority for the Corps to study water resource related issues in the American and Sacramento Rivers is Section 209 of the Flood Control Act of 1962 (Pub. L. No. 87-875, § 209, 76 Stat. 1180, 1196-98 (1962)), which authorizes studies for flood control in northern California. This report was prepared as a general reevaluation study of the American River Common Features Project, which was authorized by Section 101(a) (1) of the Water Resources Development Act (WRDA) of 1996, (Pub. L. No. 104-303, § 101(a)(1), 110 Stat. 3658, 3662-3663 (1996)) and amended by Section 366 of WRDA of 1999, (Pub. L. 106-53, § 366, 113 Stat. 269, 319-20 (1999)); and Section 130 of the Energy and Water Development Appropriations Act (EWDAA) of 2008, (Pub. L. No. 110-161, § 130, 121 Stat. 1844, 1947 (2003)). Significant changes to the authorized project cost were recommended in the Second Addendum to the Supplemental Information Report of March 2002. This report was submitted to the Assistant Secretary of the Army for Civil Works (ASA(CW)), but Congress acted to raise project costs before the 2002 report could be forwarded to Congress. (*See* Section 129 of the EWDAA of 2004, (Pub. L. No. 108-137, §129, 117 Stat. 269, 1839 (2003)) raising the authorized total cost of the project to \$205,000,000. The current estimated cost of the authorized project is \$320,700,000.

3. Project Description

The ARCF GRR study area, shown in the map below in Figure 1, has been divided into two basins: American River North and American River South, which were further subdivided into study reaches. This report covers the following areas:

- 12 miles of the north and south banks of the American River immediately upstream of the confluence with the Sacramento River
- 26 miles of the Natomas East Main Drainage Canal and tributaries (NEMDC)
- 15 miles of the east bank of the Sacramento River downstream of the American River down to Morrison Creek
- Borrow and disposal sites that are within an approximate 25 mile radius of the City of Sacramento

For the purposes of the feasibility planning process, the two study area basins were further subdivided into reaches based on common properties, such as geographic features. In general, this Report presents information either by basin or reach. However, in some cases the report structure deviates from basin or reach based organization. For instance, geology and geomorphology, construction history, and past performance are better related to channel features than basin related reaches. Therefore, for those topics, the information has been presented in the following groups: American River (both banks), Sacramento River (south of the American River confluence), and East Side tributaries (Dry and Robla Creeks, NEMDC east, and Arcade Creek), and Magpie Creek.

The American River North Basin (ARN) includes levees on the north (right) bank of the American River upstream of NEMDC, the east (left) bank of NEMDC from the American River to Arcade Creek and from Arcade Creek to Dry/Robla Creeks, both banks of Arcade Creek, both banks of Dry/Robla Creek, and Magpie Creek. The levees in the American River North Basin have been divided into eight planning reaches; ARN A, B, C, D, E, F, and I.

The American River South Basin (ARS) includes levees on the south bank (left) bank of the American River upstream of the Sacramento River and the east (left) bank of the Sacramento River from the American River to Freeport. The levees in the American River South Basin have been divided into seven planning reaches; ARS A, B, C, D, E, F, and G.

The American River Common Features GRR has identified significant and extensive seepage, stability, overtopping and erosion problems with the levees that reduce the risk of flooding for the Sacramento area, and recommendations to address these problems are the focus of this Recommended Plan. Due to the potential for catastrophic consequences associated with a levee failure in this urban area, all identified problems, including vegetation and encroachment issues require correction in order to reduce the flood risk to an acceptable level. However, risk reduction measures must be implemented in a “worst first” manner in order to immediately maximize the amount of risk reduction realized for each increment of investment. The levee improvement methods would combine a variety of potential designs described in Section 4 description of lands, easements, right of way, relocations and disposals (LERRD’s) of this report and keep the project features within the existing footprint of the American River Common Features Project as much as possible. The project area includes portions of the Sacramento and American River Watersheds. The floodplain includes most of the developed portions of the City of Sacramento and portions of Sacramento County. The study area also includes the Sacramento Weir and Bypass in Yolo County,

California.

The final array of alternatives includes:

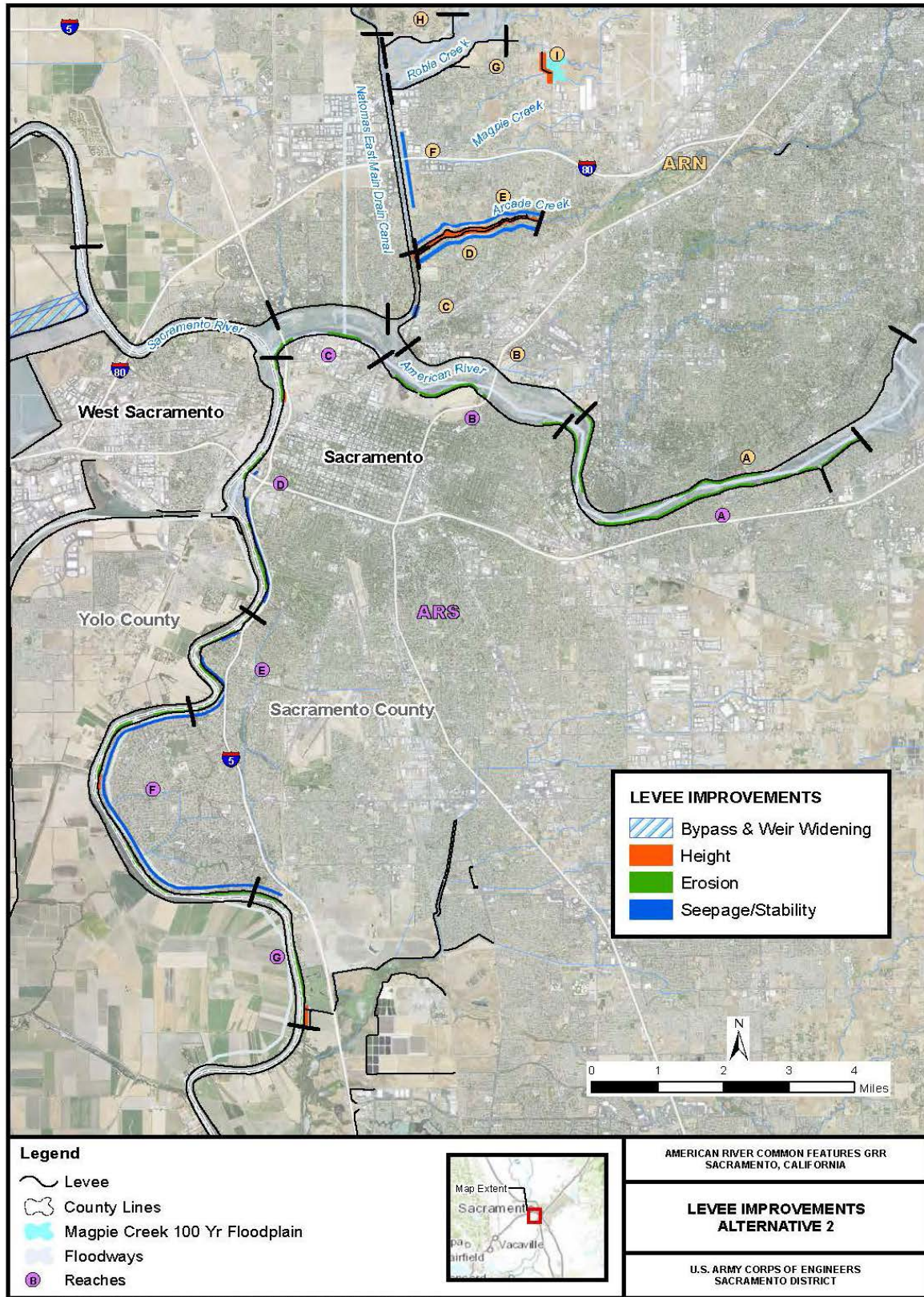
Alternative 1 would include the construction of levee improvement measures to address seepage, stability, erosion, and height measures identified for the Sacramento River, Natomas East Main Drainage Canal (NEMDC), Arcade, Dry/Robla, and Magpie Creeks. Alternative 1 would also include erosion measures for specific locations along the American River. This alternative combines construction of levee improvement measures while maintaining the present levee alignment in its existing location (fix in place). Due to the urban nature and proximity of existing development within the American River North and South basins, Alternative 1 proposes to improve the levees within their existing footprint, with minimal additional real estate requirements. The purpose of this alternative would be to improve the flood risk management system to safely convey flows to a level that maximizes net benefits.

Alternative 2 – Alternative 2 would include the levee improvements discussed in Alternative 1, except for the extent of levee raises along the Sacramento River. While Alternative 1 would include about 7 miles of levee raising, Alternative 2 would only require about 1 mile of levee raising. The Sacramento Weir and Bypass would be widened to divert more flows into the Yolo Bypass. The levees along the American River North Basin Tributaries, including the NEMDC, Arcade, Dry/Robla, and Magpie Creeks, would be improved to address identified seepage, stability, erosion, and height concerns through the methods described under Alternative 1. The levees along the Sacramento River would be improved to address identified seepage, stability, and erosion concerns through the measures described under Alternative 1. Rock erosion protection would be placed on the American River levees to reduce the risk of erosion. Due to environmental, real estate, and hydraulic constraints within the American River North and South basins, the majority of the levees would be improved within the existing levee footprint with minimal additional real estate requirements.

The project alternatives consist of components and cost estimates of the various reaches which will be described in further detail below.

This real estate plan identifies the real estate costs for the Recommended Plan (Alternative 2) – Improve Levees and Widen the Sacramento Weir and Bypass.

FIGURE 1 AMERICAN RIVER BASINS AND PROJECT REACHES



4. Description of LERRD's

The Lands, Easements, Right of Way, Relocations and Disposal (LERRD's) requirements for the REP for the Recommended Plan are estimated at \$90,938,477. There are an estimated 495 parcels and 369 ownerships that equate to 1,720 acres that are included in the Recommended Plan.

Bank Protection – There are 287.31 acres of bank protection required along the Sacramento and American Rivers. This easement needed for construction and maintenance of erosion protection features. Included are the rights to trim and cut vegetation, shape and grade slope, and replace riprap. The easement includes all area required to construct and maintain erosion protection features that are outside of the Flood Protection Levee Easement. Two erosion protection measures have been proposed that could be implemented in combination along the levee alignment depending on bank geometry, existing habitat and existing land use. Rock bank protection and launchable rock trenches will address erosion problems along portions of the American River north and south levees and along the Sacramento River.

Flood Protection Levee Easement – There are 142.55 acres of flood protection levee easements needed for new levees, levee raises, flood walls, cutoff walls, and seepage berms. These include the right to construct, maintain, repair, operate and patrol the flood protection features. This easement includes all area from landside toe to waterside toe of the existing and/or proposed levee.

Permanent Road Easement – Easement for O&M inspection zone at the landside toe. .210 acre required for new access road. This easement would allow easier access for flood fighting activities as well as inspections required for the Rehabilitation and Inspection Program (RIP) under Engineering Regulation (ER) ER 500-1-1 and Public Law (PL) 84-99.

Permanent Flowage Easement – There is a total of 337.78 acres of land that will be subject to permanent flooding as a result of new levees in the Sacramento Bypass (257.22 acres) and a new levee with floodgates, levee raise, floodplain preservations with culvert improvements near Magpie Creek. (80.56 acres)

Temporary Work Area Easements – Staging is required every mile along the length of the project. Majority of the staging areas will be located in the river parkways, and other publically owned areas along the rivers. Staging areas will accommodate batch processing stations for slurry walls, construction vehicles, and temporary storage for disposal and construction materials. The total staging acres required are estimated at 40 acres. The haul routes will be existing public roads and utilizing the existing roads on top of levees. For cost estimating purposes we calculated a certain acreage for each reach of the project for staging areas. All staging areas are not yet identified on cadastral maps. The remaining temporary work area easements are located on existing federal levees for a total of over 227 acres.

Borrow Easements – Borrow easements are required for potential borrow and disposal sites as shown in the borrow map Figures 2 and 3. It is anticipated that 407.25 acres or 1,612,009 cubic yards of potential borrow sites material is required for construction of the proposed project. It is anticipated that significant quantities of material will be required for construction of the proposed project. Several different improvement measures such as seepage berms, cutoff walls, embankment construction -reconstruction, and erosion protection are proposed.

Appendix D - Real Estate Plan

The material is expected to be sourced from several sites including; newly identified borrow sites within approximately 25 miles of the study area, existing borrow sites identified for the Natomas Basin by SAFCA, the Deep Water Ship Channel dredge disposal area, the existing levees, and existing commercial sources. Test pits and laboratory testing on materials collected from test pits were provided by SAFCA as part of the Natomas Levee Improvement Program (NLIP) for borrow sites established for the Natomas Basin. Additionally, the Sacramento District has studied the Deep Water Ship Channel spoil areas as a borrow source several time in the past, and a discussion of that borrow source is included below. Typically projects constructed by the Sacramento District utilize commercial borrow sites near the project area.

It is anticipated that the required soil fill import for the proposed project will exceed the capacities of the already identified borrow sites in the Natomas Basin, and obtaining significant quantities of material from commercial sites may be cost prohibitive. Therefore, a desktop regional borrow study was performed to identify potential borrow sites, within 25 miles of the study area, where enough soil could be sourced to satisfy the project needs. This study was performed by obtaining National Resources Conservation Service (NRCS) National Cooperative Soil Survey (NCSS) data, sorting the NCSS data based on material classification and engineering properties, using aerial photographs to identify areas of open or agricultural land, and then merging the sorted NCSS data with the open or agricultural land areas to obtain locations, acreage, and volume of potential borrow sites. Results of the desktop regional borrow study indicate adequate materials available within the assumed 25 mile area.

A map that proposed potential sites was created and several potential sites identified. The rough assumptions the Corps used was the material had to meet geotechnical requirements either by open undeveloped land or agricultural areas, and was located between ground surface and a depth of 2.5 feet below ground surface. In the high confidence areas in each basin the estimated amount of borrow needed within a 25 mile haul route radius is calculated below with costs for borrow. The high confidence areas were defined as areas where up to 48 inches of borrow could be excavated as opposed to the low confidence areas where only up to 12 inches of material would be available where 3 times the amount of land would be required. The below quantities estimate the potential quantities of material required and the cost.

American River South Basin High Confidence Area requires 69.76 AC of land for 275,743 CY of borrow = $\$453,400 + (35\% \text{ cont} + 15\% \text{ severance} = 226,700) = \$680,100$

American River North Basin High Confidence Area requires 0.64 AC of land for 2,519 CY of borrow = $\$4,186 (35\% \text{ cont} + 15\% \text{ severance } \$2,093) = \$6,279$

Natomas Basin High Confidence Area requires 337.43 AC of land for 1,333,747 CY of borrow = $\$2,193,295 (35\% \text{ cont} + 15\% \text{ severance} = \$1,096,647.50) = \$3,289,942$. The below map shows high confidence areas of available borrow where up to 48" of material can be excavated at one time.

The estates, project features, type of ownership and acreage required by reach for the project are shown in Table 1 with associated location maps.

TABLE 1 - LERRD'S FOR RECOMMENDED PLAN

American River South Basin

ARS REACH A	Erosion Protection		
Features	4 Ownerships	Estate	Acres
Bank Protection Rock Trench	5 City parcels, 29 County of Sacramento parcels, 5 Cal Trans parcels	Bank Protection Easement	61.41
		Total	61.41

American River South Basin

ARS REACH B	Erosion Protection		
Features	7 Ownerships	Estate	Acres
Bank Protection Rock Trench	3 Private parcels	Bank Protection Easement	.970
Bank Protection Rock Trench	1 Cal Trans parcel, 6 City of Sacramento Parcels and 2 County of Sacramento parcels, 1 DOT parcel	Bank Protection Easement	15.076
		Total	16.046

American River South Basin

ARS REACH C	Erosion Protection		
Features	6 Ownerships	Estate	Acres
Bank Protection Rock Trench	6 Private parcels	Bank Protection Easement	2.65
Bank Protection Rock Trench	1 Cal Trans parcel, 5 City parcels/6 County of Sacramento parcels, 1 DOT parcel	Bank Protection Easement	11.11
		Total	13.76

American River

ARN REACH A	Erosion Protection		
Features	8 Ownerships	Estate	Acres
Bank Protection Rock Trench	4 Private parcels	Bank Protection Easement	5.84
Bank Protection Rock Trench	3 Sponsor parcels, 27 parcels County of Sacramento	Bank Protection Easement	39
		Total	44.81

American River

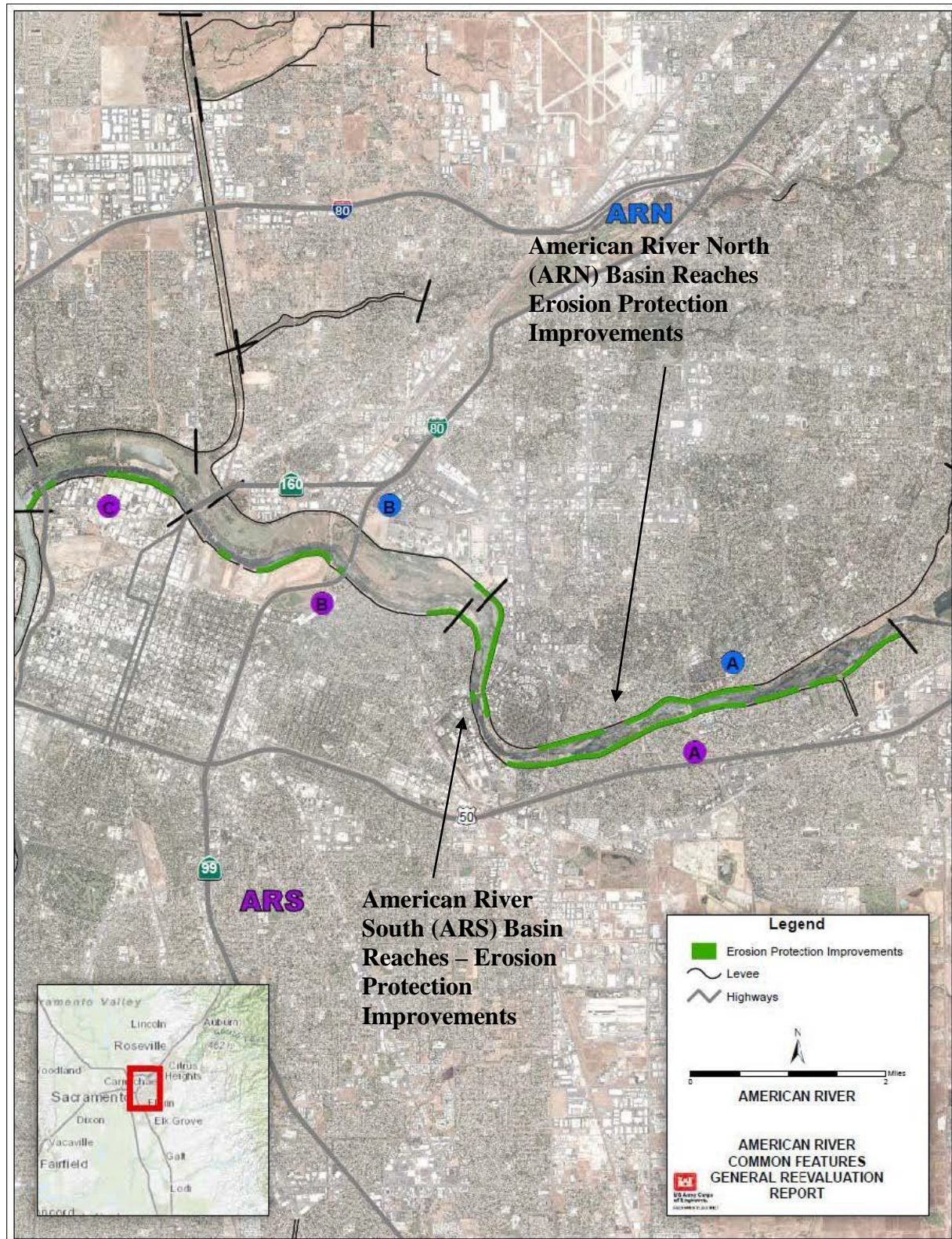
Appendix D - Real Estate Plan

ARN REACH B	Erosion Protection		
Features	2 Ownerships	Estate	Acres
Bank Protection Rock Trench	1 State of CA parcel, 1 County of Sacramento parcel	Bank Protection Easement	2.41
		Total	2.41

American River

ARN REACH C	NEMDC		
Features	2 Ownerships	Estate	Acres
Cut off Wall/Flood Wall	3 City of Sacramento parcels, 4 parcels County of Sacramento	Temporary Work Area Easement	3.71.
		Total	3.71

FIGURE 2: Location Maps of Reaches ARN A, B, and C and ARS A, B and C. Erosion Protection Improvements shown in green.



Sacramento River

ARS REACH D			
Features	9 Ownerships	Estate	Acres
Bank Protection Rock Trench 2 – 4 'Floodwall Cutoff Wall Seepage Berm at Pioneer Reservoir	5 Private parcels	Temporary Work Area Easement for Staging	.344
Bank Protection Rock Trench	2 Private parcels	Bank Protection Easement	1.57
Flood wall, Cut off Wall, Seepage Berm at Pioneer	5 State parcels, 14 City parcels	Flood Levee Protection Easement	3.87
Bank Protection Rock Trench	5 State parcels 13 City parcels	Bank Protection Easement	19.41
Bank Protection Rock Trench 2 – 4 'Floodwall Cutoff Wall Seepage Berm at Pioneer Reservoir	5 State parcels 13 City parcels	Temporary Work Area Easement for Staging	2.49
		Total	27.68

Sacramento River

ARS REACH E			
Features	59 Ownerships	Estate	Acres
120' DSM Cut off Wall	58 Private parcels	Flood Protection Levee Easement	18.02
Bank Protection	3 Private parcels	Bank Protection Easement	3.17
120' DSM Cut off Wall	3 State of CA parcels 2 City of Sacramento parcels, 1 sponsor owned parcel	Flood Protection Levee Easement	8.48
Bank Protection	3 State of CA parcels, 8 City of Sacramento parcels	Bank Protection Easement	17.17
		Total	46.84

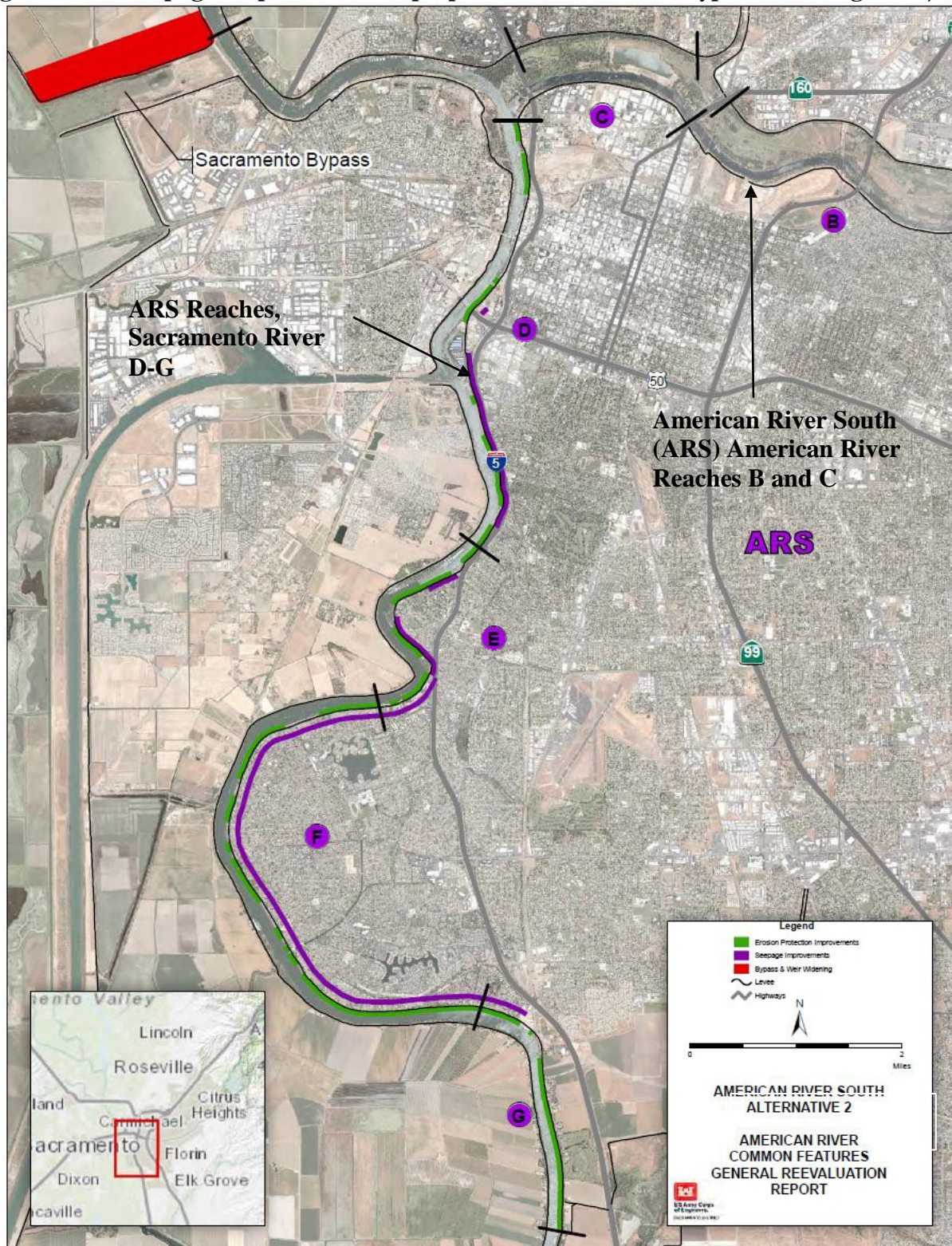
Sacramento River

ARS REACH F			
Features	128 Ownerships	Estate	Acres
Cut off Wall, Flood wall	1 Private parcels	Flood Protection Levee Easement	.499
Bank Protection	5 Private parcels	Bank Protection Easement	14.57
Existing Levee/Levee Raise	130 Private parcels	Temporary Work Area Easement	59.31
Bank Protection Rock Trench	1 State of CA parcel, 35 City of Sacramento parcels	Bank Protection Easement	23.05
Existing Levee/Levee Raise	1 State of CA parcel, 5 City of Sacramento parcels	Temporary Work Area Easement	4.69
		Total	111.32

Sacramento River

ARS REACH G			
Features	20 Ownerships	Estate	Acres
DSM Cut off Wall	Private 21 parcels	Flood Protection Levee Easement	21.20
Geotextile Stabilized Slope	Private 1 parcel	Bank Protection Easement	4.79
Raise Existing Flood Wall	Private 5 parcels	Temporary Work Easement	2.95
DSM Cut off Wall	2 State of CA, 2 City of Sacramento, 1 County parcel	Flood Protection Levee Easement	5.35
Geotextile Stabilized Slope	10 State of CA, 2 City of Sacramento, 1 County parcel	Bank Protection Easement	14.66
Raise Existing Flood Wall	2 State of CA, 2 City of Sacramento, 1 County	Temporary Work Easement	.568
		TOTAL	49.51

FIGURE 3: Sacramento River Improvements ARS Reaches D-G (Erosion Protection = green lines, Seepage improvements = purple lines, Sacramento Bypass widening = red)



Sacramento River

SAC BYPASS	Enlarge existing bypass		
Features	10 Ownerships	Estate	Acres
Bypass Flowage Area	4 Private parcels	Flowage Easement	123.46
New Levee	4 Private parcels	Flood Protection Levee Easement	107.86
Bypass Flowage Area	1 Sponsor owned parcel	Flowage Easement	133.76
New Levee	1 Sponsor owned parcel, 1 County parcel	Flood Protection Levee Easement	1.63
		TOTAL	366.71

Widening of the Sacramento Weir and Bypass to reduce the water surface elevation in the Sacramento River and allow more water to flow into the Bypass system.

Aerial View of Sacramento Weir

FIGURE 4



East Side Tributaries

ARN REACH D	Arcade Creek S. Bank		
Features	28 Ownerships	Estate	Acres
Flood wall/Geotextile reinforced slope	3 Private parcels	Temporary Work Area Easement	2.40
Flood wall/Geotextile reinforced slope	20 Private parcels	Flood Protection Levee Easement	17.37
Flood wall/Geotextile reinforced slope	3 American River Flood Control District, 2 City of Sac, 1 Twin Lakes Public School	Temporary Work Area Easement	.085
Flood wall/Geotextile reinforced slope	3 American River Flood Control District, 3 City of Sac, 1 Twin Lakes, Public School	Flood Protection Levee Easement	.516
		Total	20.37

East Side Tributaries

ARN REACH E	Arcade Creek North Bank		
Features	41 Ownerships	Estate	Acres
Cut off Wall/Flood Wall/	23 sponsor owned parcels	Flood Protection Levee Easement	.541
Cut off Wall/Flood Wall	1 Private parcels	Temp work area easement	.042
Cut off Wall/Floodwall	23 Private parcels	Flood Protection Levee Easement	10.62
		Total	11.23

East Side Tributaries

ARN REACH F	NEMDC		
Features	3 Ownerships	Estate	Acres
Cut off Wall/Flood Wall/ Replace existing w/closed box culvert	7 RD 1000 parcels 9 W. Pacific Railroad parcels 1 Cal Trans, 1 City of Sacramento Parcel	Temporary Work Area Easement	20.73
		Total	25.600

East Side Tributaries

ARN REACH I	Magpie Creek		
Features	30 Ownerships	Estate	Acres
New Levee with floodgates, Levee Raise, Floodplain Preservation, Culvert Improvements	4 Sponsor owned parcels, 1 USA AF Base parcel, 3 Private parcels	Temporary Work Area Easement	1.73
New Levee with floodgates, Levee Raise, Culvert Improvements	4 Sponsor owned parcels, 1 USA AF Base parcel, 5 Private parcels	Flood Protection Levee Easement	3.41
Floodplain Preservation	4 Sponsor owned parcels, 20 Private parcels	Flowage Easement	80.37
New Levee with floodgates, Levee Raise, Floodplain Preservation, Culvert Improvements	1 Private parcel	Temporary Work Area Easement	.119
New Levee with floodgates, Levee Raise, Culvert Improvements	1 Private parcel	Flood Protection Levee Easement	.156
		Total	85.78

Figure 5: Eastside Tributaries – Levee Improvements

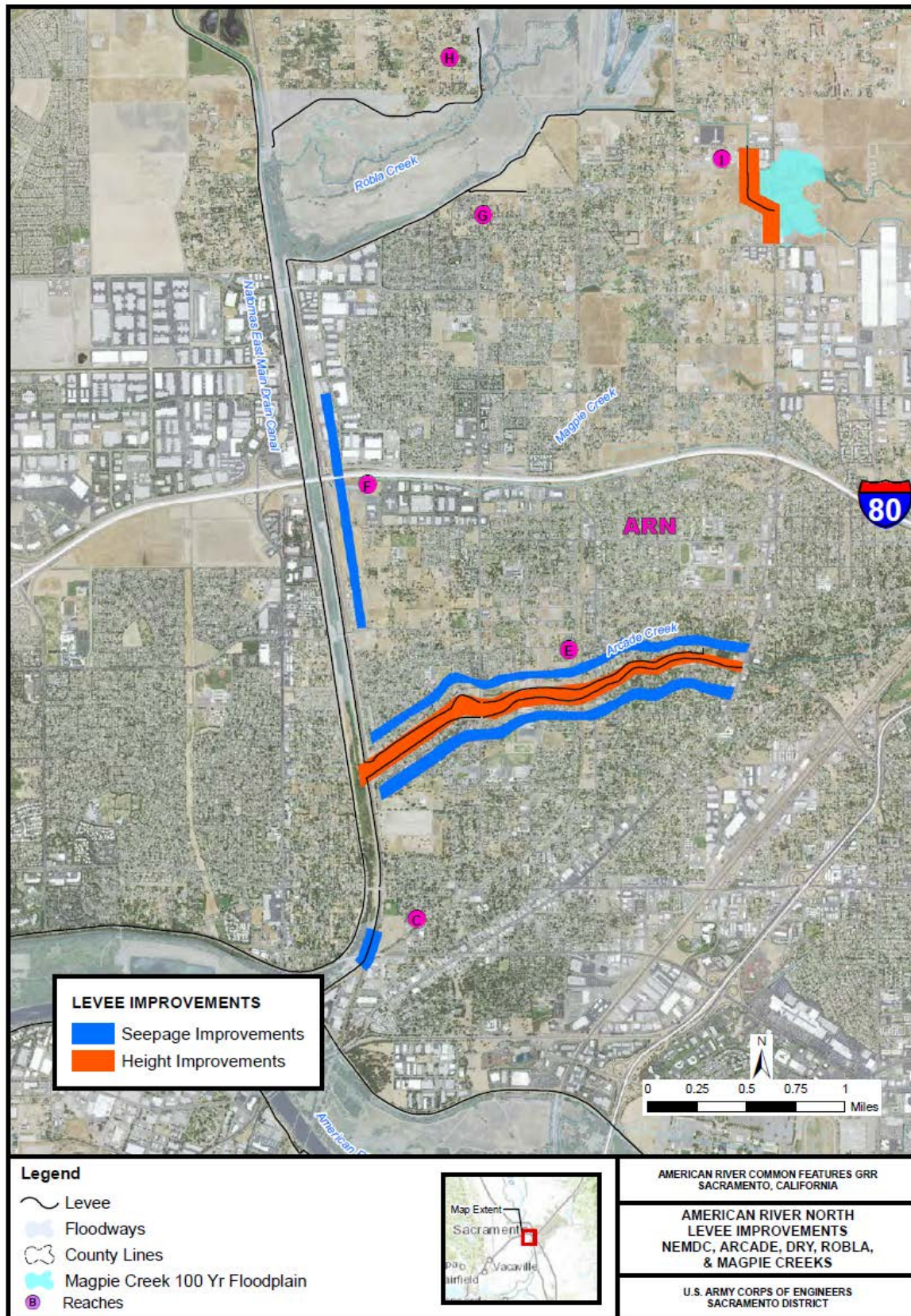
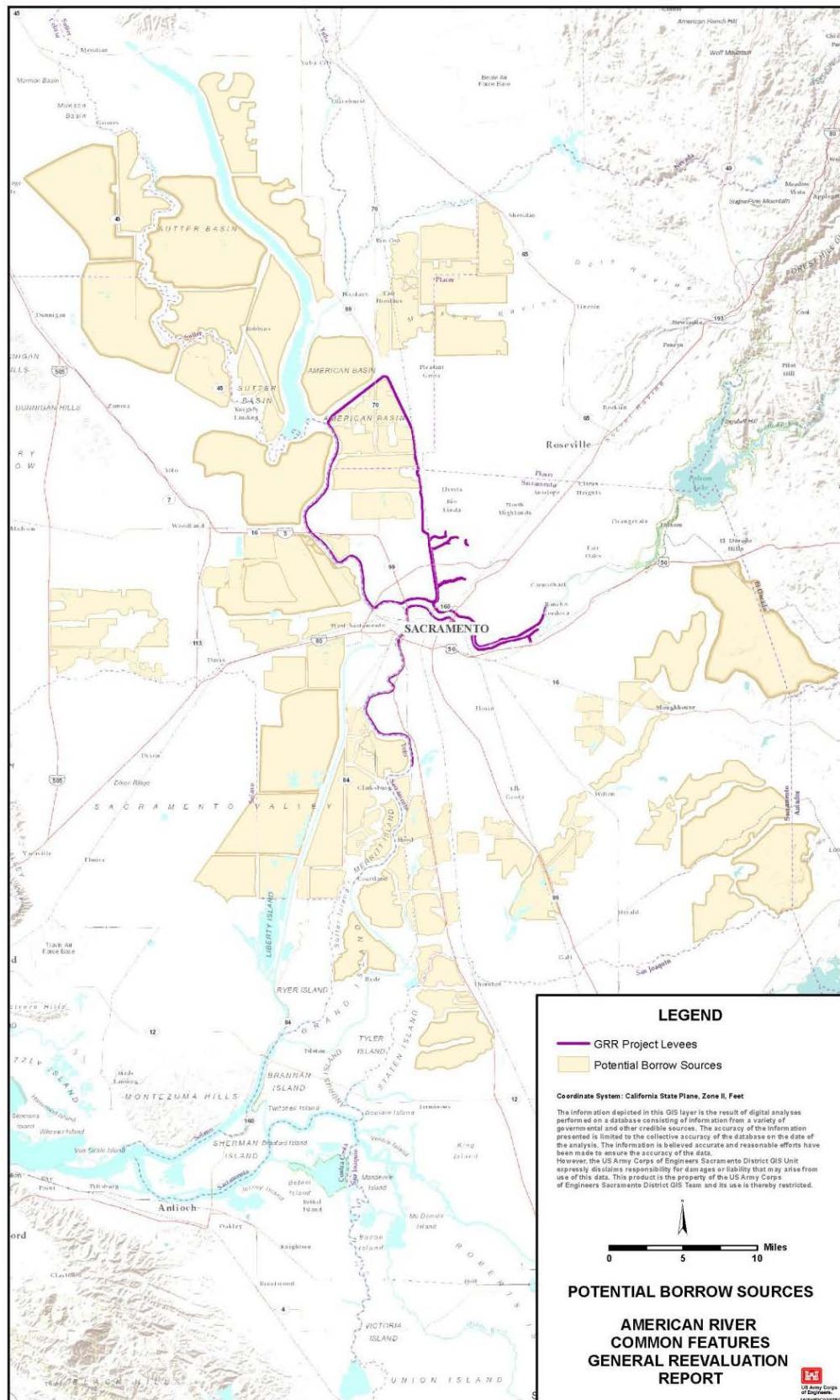


Figure 6: Proposed Borrow Sites within 25 Miles of Construction Sites



Environmental Mitigation – The following table summarizes environmental mitigation needs. Specific lands for compensation have not been identified; however, lands considered will provide similar habitat to that being impacted. The Corps has determined that mitigation for giant garter snake, Delta smelt, wetlands, and vernal pools would occur at a mitigation bank. If available, the Corps would also seek a mitigation bank for green sturgeon mitigation. Due to the significant value of the remaining mature riparian habitat along the Sacramento and American Rivers, and the significant loss of habitat value that would occur due to project impacts, the Corps would mitigate onsite for SRA, riparian, oak woodland, and elderberry habitats. If sufficient acreage is not available onsite for these habitat types, then the Corps would seek offsite options within the American River Parkway. More information regarding the Corps mitigation strategy is included in the Mitigation, Monitoring, and Adaptive Management Plan (Appendix F of the GRR).

Table 2 Environmental Impacts of and Proposed Mitigation/Compensation for the Recommended Plan (1)

Habitat Type	Potential Impacts	Duration of Impact	Mitigation (Acres/Linear Feet)	Cost at Mitigation Bank	Cost On- or Off-Site within Study Area
GGS Uplands	30 acres 75 acres	Permanent Temporary	90 acres 75 acres	\$4,500,000	N/A*
GGS Aquatic	15 acres	Permanent	45 acres	\$2,250,000	
Riparian	150.6 acres	Permanent	301.2 acres		\$16,566,000
Shaded Riverine Aquatic Habitat	82,325 lf	Permanent	82,325 lf		\$19,020,000**
Elderberry Shrubs	3,292 stems	Permanent	1,715.6 credits 70.89 acres		\$6,026,000
Vernal Pools	1 acre	Permanent	1 acre	\$275,000	---
Green Sturgeon	20 acres	Permanent	Restore acres, monitoring, and fish passage features		\$16,259,000
Delta Smelt Spawning Habitat	34 acres	Permanent	34 acres	\$4,160,000	
Shallow Water Habitat (Delta Smelt)	14 acres	Permanent	42 acres	\$5,460,000	
Oak Woodland	2 acres	Permanent	4 acres		\$200,000
Wetlands	0.4 acres	Permanent	0.8 acres	\$130,000	---
Sub-Total				\$16,775,000	\$58,341,000

* 75 acres of temporary effects to GGS habitat from the relocation of the Sacramento Bypass toe drain would consist of standard site restoration erosion control features such as hydroseeding. This is contained within construction costs and is not considered a mitigation cost.

** SRA habitat mitigation is provided in the project's cost estimate as a separate construction cost rather than a mitigation cost, since it is a feature of the bank protection designs and would be included as a part of the construction contract. The cost is displayed under the Fish and Wildlife Facilities account as "Construction" costs and is estimated to be approximately \$231 per linear foot.

Additionally, during the design phase of the project, opportunities will be taken to choose a design that will minimize effects to the American River Parkway where feasible. After coordination with federal and state agencies, potential mitigation sites will be displayed in the design memorandum and refined during design phase.

Overall, after implementation of mitigation components, the mitigation sites would be monitored throughout the year for a minimum of 3 years, or until the mitigation sites are considered successful. A mitigation, monitoring, and adaptive management plan was developed and is included as Appendix I of the EIS/EIR.

In an effort to modernize the levee system to meet current engineering standards, vegetation and encroachment issues (including landside levee access) in the study area will be resolved through a combination of construction actions associated with implementation of the recommended plan and formal agreements such as a System Wide Improvement Framework Policy (SWIF) which allows specific vegetation and/or encroachments to remain in place permanently or defer their resolution to some future date. A SWIF provides committed sponsors the opportunity to transition their levees over time to USACE standards. By using a SWIF, sponsors can prioritize deficiencies to address the highest risk first to achieve system-wide risk reduction.

In preparing the requirements for a SWIF, USACE recognized that sponsors may engage at the federal, state, and local levels to address complex levee system issues in a more long-term, comprehensive approach to identify solutions that optimize resources; prioritize improvements and corrective actions based on risk; and coordinate overlapping or competing programs and requirements.

A SWIF is appropriate when a longer-term, holistic approach may be necessary to address multiple engineering deficiencies and operation and maintenance deficiencies; when broader improvements involve multiple levee segments/systems; or when additional time and coordination are needed to consider complex, endangered species habitat or Native American concerns, or encroachment concerns in highly urbanized areas while meeting requirements for levee safety.

In the case of construction associated with the recommended plan, vegetation and encroachment removal is anticipated as ancillary to the primary flood risk management measure (i.e. seepage cutoff barrier, levee raise, slope flattening) being constructed. In the case of a formal agreement, the integrated use of a SWIF and a variance from vegetation standards would both be required to ultimately assure compliance with Engineering Technical Letter (ETL) 1110-2-571 *“Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams, and Appurtenant Structures”*.

The SWIF would address vegetation and encroachment issues (including landside levee access) not removed as part of construction associated with the recommended plan but deemed unacceptable in terms of compliance with the engineering technical letter (ETL). A variance to vegetation management will be developed during PED to allow for vegetation to remain on the lower portion of the waterside levee slope. If a variance is not approved, the recommendations for this portion of the project will be reformulated.

Complete implementation of the Recommended Plan will be assumed to occur at the same time as complete implementation of the SWIF. Based on current experience in the watershed, the complete implementation of these two plans can reasonably be expected to occur within 20 to 40

years from the approval of the Chief's Report for the GRR.

Two assumptions were made in this SWIF analysis – (1) that the existing levee easement locations are continuous and extend from waterside toe to 10 feet beyond landside levee toe which would eliminate new permanent road easements (2) The cost estimate assumes the State has existing right of way on existing levees. If it is confirmed that the state has existing rights prior to construction a temporary construction easement would be executed in lieu of a permanent flood protection levee easement.

Figure 7: Sacramento River Levee Improvements with System Wide Improvement Framework Policy no Levee raises

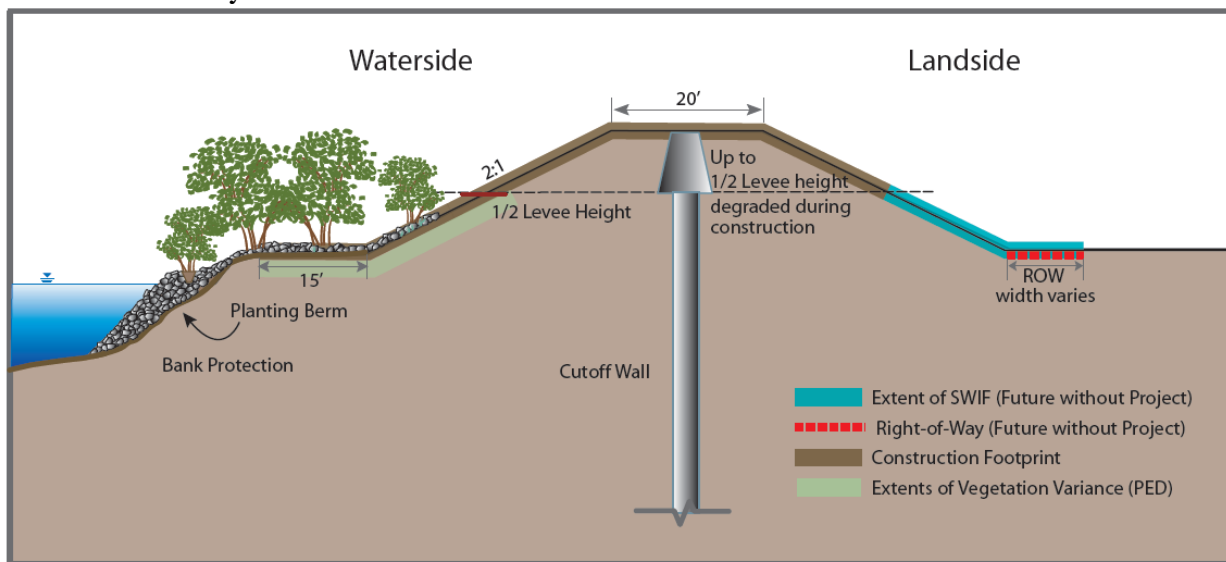
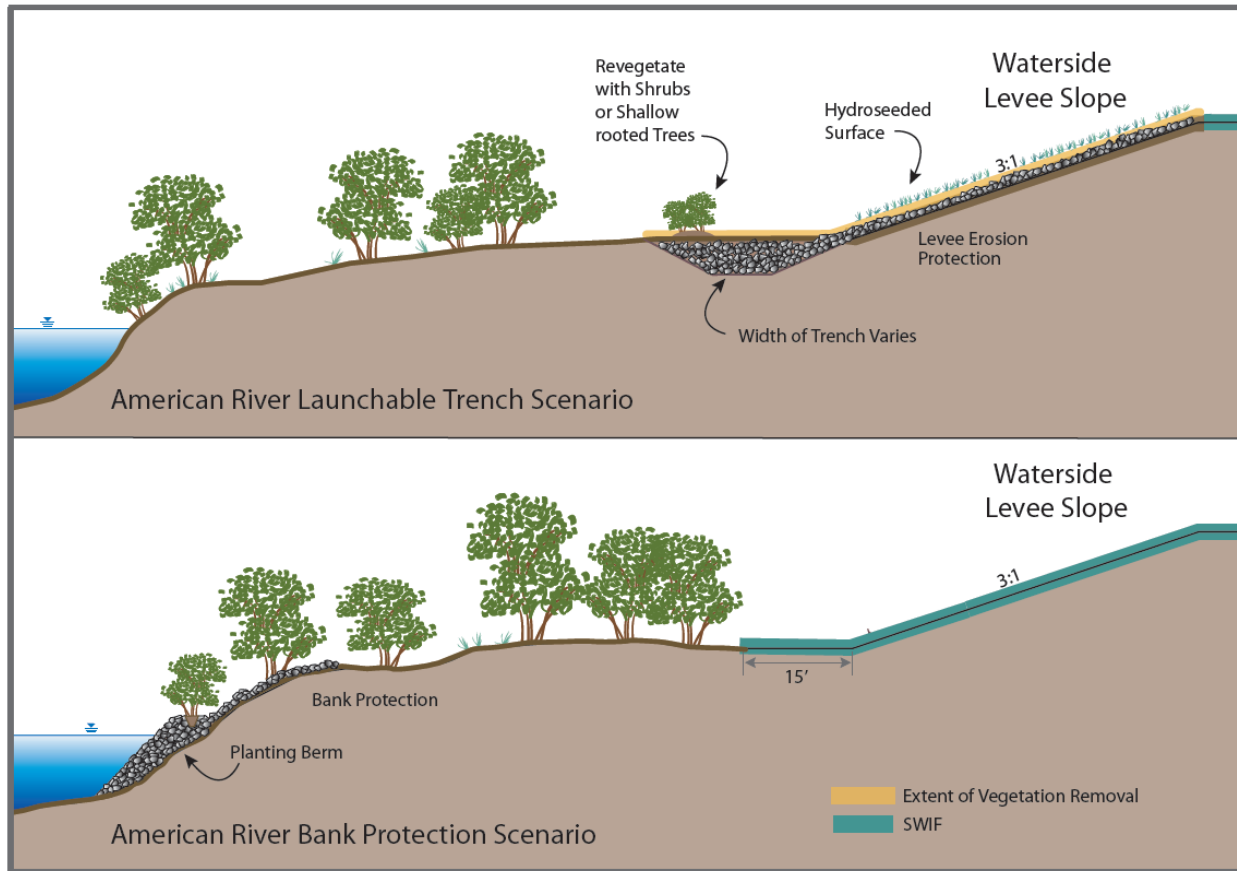


Figure 8: American River Levee Improvements with System Wide Improvement Framework Policy no Levee raises



Disposal Sites

Majority of the deconstructed levee material will be recycled and reused in this project. There may be small amounts of disposal material that will be disposed of at the local landfill. Disposal areas need to be selected on least costly areas.

Railroad Parcels

An inventory of the railroad parcels impacted by this project is as follows:

Reach	Railroad	Easement Required
ARS Reach G	Southern Pacific Railroad	Temporary easement 2 parcels
ARN Reach B	Southern Pacific Railroad	Bank Protection easement 1 parcel
ARN Reach D	Northern Sacramento Railway	Temporary Easement 1 parcel
ARN Reach F	Western Pacific Railroad	Temporary Easement 3 parcels
Sacramento Bypass	Sierra Northern Railway Trestle	Levee Easement & Flowage Easement 1 parcel

Figure 9: Sierra Northern Railway Bridge crossing over the Sacramento Weir

The construction of the widened Sacramento Weir and the adjoining railroad will likely be phased as follows. First, the new weir and railroad trestle will be constructed adjacent to the existing Sacramento River levee and the embankment of the railroad. Second, a slight jog in the railroad alignment will be constructed tying in the new trestle to the existing railroad line (both to the south tying into the existing weir/trestle structure and to the north tying into the continuation of the rail line. Then, after the new north levee has been constructed and the Sacramento River levee that would then be within the bypass has been removed, the entire widened Sacramento Bypass would be operational.

The actual disruption to the railroad is expected to be minimal because they will be kept in operation during the entire duration of construction of the new weir and trestle and would only need to be shut down during the time it takes to tie into the existing tracks which is expected to take not more than one month. With this plan, there will not need to be a temporary railroad line established and the associated costs would not need to be incurred. Coordination with Sierra Northern Railroad General Manager in Woodland will continue through the planning and construction phases of the project.

The other easements areas crossing over railroad parcels should not prevent the trains from moving and include no closure structures.

5. LERRD'S Owned by the NFS and Crediting

The following parcels represent sponsor owned lands as shown in Table 3. The primary non-Federal sponsors are the State of California Central Valley Flood Protection Board, California and the Sacramento Area Flood Control Agency (SAFCA). The State has a joint use agreement with Reclamation District 1000 in Natomas Basin for access. The State has a joint use agreement for access with the American River Flood Control District. The non-Federal sponsors already have access easements in the prior federally constructed levees. Those existing rights will not be cost-shared items. The project foot print of the levees has expanded and many additional areas

are now required for this project. Parcels already owned by Sacramento and San Joaquin Drainage District (State of California) and the SAFCA are included in this inventory as well. State owned lands associated with Department of Water Resources and Sacramento and San Joaquin Drainage District are considered to be sponsor owned and available for the project. Other California State agencies such as Cal Trans and State Parks are not considered to be sponsor owned and will require a new easement executed. For Alternative 2 the Non Federal sponsors own a total of 64.32 acres. There are two parcels in the Sacramento Bypass owned by the Sacramento and San Joaquin Drainage District but the construction footprint parcels for the Bypass expansion are owned by private farmers. However, these 64.32 acres identified in the tract registers are assumed sufficient to support project purposes/functions, and no inconsistent encumbrances and/or restrictions on said land is anticipated. The potential impact to project costs and/or plan selection as a consequence of this uncertainty is minimal inasmuch as the gross appraisal conservatively estimates the unit costs for the estates required for project purposes and includes seven incremental and improvement contingencies for various unknowns including severance damages, unknowns for level of study definition, unforeseen aspects due to inaccessibility and lack of onsite inspections, cost/value increases from time and development pressure, negotiation latitude above fair market value, potential for excessive cost/awards, potential for unknowns natural resources or minerals, improvement/building contingencies. Accordingly, this contingency assessment should reduce risk and cause no impact to plan selection.

The non-Federal sponsors have existing access easements in the prior federally constructed levees and it has been assumed for purposes of this study that the non-Federal sponsors will be required to acquire temporary work area easements to implement the Recommended Plan and the easement costs have been included in the total project cost estimate. If, during the PED Phase existing levee easements in prior Federally-constructed levees are discovered and available, those existing rights will not be cost-shared, which may lower total project costs.

TABLE 3 Sponsor-Owned Lands Summary

Location of Lands	Acreage
Total Acres Required Sponsor owned ARN	32.66
Total Acres Required Sponsor owned ARS	31.66

6. Standard Federal Estates and Non Standard Estates

Fee

The fee simple title to, subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Flood Protection Levee Easements (FPLE)

A perpetual and assignable right and easement in to construct, maintain, repair, operate, patrol and replace a flood protection levee, including all appurtenances thereto; reserving, however, to the owners, their heirs and assigns, all such rights and privileges in the land as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Temporary Work Area Easements (TWAE)

A temporary easement and right-of-way in, on, over and across for a period not to exceed 2/3 years after the execution of the construction contract, beginning with date possession of the land is granted to the Sponsor or United States, for use by the United States, Sponsor, its representatives, agents, and contractors as a (borrow area) (work area), including the right to borrow and/or deposit fill, spoil and waste material thereon) (move, store and remove equipment and supplies, and erect and remove temporary structures on the land and to perform any other work necessary and incident to the construction of the American River Project, together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions, and any other vegetation, structures, or obstacles within the limits of the right-of-way; reserving however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Permanent Road Easement (PRE)

A perpetual and assignable easement and right-of-way in, on, over and across [the lands described in the Exhibit D] for the location, construction, operation, maintenance, alternation and replacement of (a) road(s) and appurtenances thereto; together with the right to trim, cut, fell and remove therefrom all trees, underbrush, obstructions and other vegetation, structures, or obstacles within the limits of the right-of-way; (reserving, however, to the owners, their heirs and assigns, the right to cross over or under the right-of-way as access to their adjoining land at the locations indicated in [the lands described in the Exhibit D] subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines.

Borrow Easement

A perpetual and assignable right and easement to clear, borrow, excavate and remove soil, dirt, and other materials from [the lands described in the Exhibit D] subject, however, to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges in said land as may be used without interfering with or abridging the rights and easement hereby acquired.

Bank Protection Easement

A perpetual and assignable easement and right-of-way in, on, over and across the land hereinafter described for the location, construction, operation, maintenance, alteration, repair, rehabilitation and replacement of a bank protection works, and for the placement of stone, riprap and other materials for the protection of the bank against erosion; together with the continuing right to trim, cut, fell, remove and dispose therefrom all trees, underbrush, obstructions, and other vegetation; and to remove and dispose of structures or obstructions within the limits of the right-of-way; and to place thereon dredged, excavated or other fill material, to shape and grade said land to desired slopes and contour, and to prevent erosion by structural and vegetative methods and to do any other work necessary and incident to the project; together with the right of ingress and egress for such work; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used without interfering with or abridging the rights and easement hereby acquired; subject, however to existing easements for public roads and highways, public utilities, railroads and pipelines.

Flowage Easement

The perpetual right, power, privilege and easement occasionally to overflow, flood and submerge [the lands described in the Exhibit D] (and to maintain mosquito control) in connection with the operation and maintenance of the project as authorized by the Act of Congress approved_____,

together with all right, title and interest in and to the structure; and improvements now situate on the land, except fencing (and also excepting____(here identify those structures not designed for human habitation which the District Engineer determines may remain on the land)); provided that no structures for human habitation shall be constructed or maintained on the land, that no other structures shall be constructed or maintained on the land except as may be approved in writing by the representative of the United States in charge of the project, and that no excavation shall be conducted and no landfill placed on the land without such approval as to the location and method of excavation and/or placement of landfill; the above estate is taken subject to existing easements for public roads and highways, public utilities, railroads and pipelines; reserving, however, to the landowners, their heirs and assigns, all such rights and privileges as may be used and enjoyed without interfering with the use of the project for the purposes authorized by Congress or abridging the rights and easement hereby acquired; provided further that any use of the land shall be subject to Federal and State laws with respect to pollution.

7. Description of Any Existing Federal Projects in or Partially in the Proposed Project

All project designs have taken into account all previous federal projects in the project area and specifically designed around those previous projects. There will be no overlapping areas with the new construction. All previous federal projects are described in the main report in section 1.5 of the main General Reevaluation Report. If any other Federal project completes work contemplated by this GRR, it will be removed from this project's footprint such as Sacramento River Bank Protection Project.

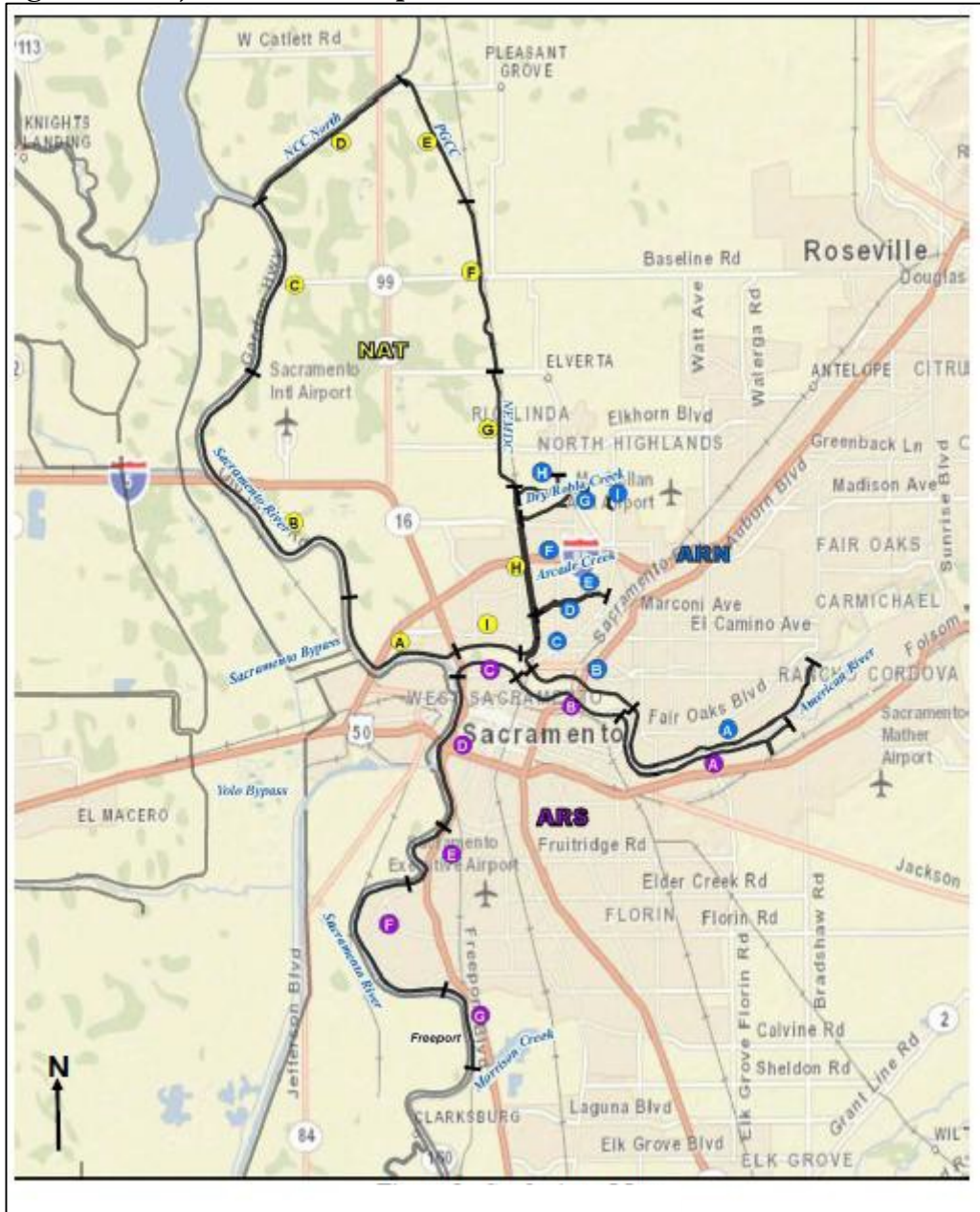
8. Description of any Federally Owned Land Needed for the Project

There is one federally owned parcel (215-0244-011) in ARN Reach I. This area was formerly McClellan Air Force Base. One parcel in the flowage easement area of Magpie creek still belongs to the base according to the county assessor's office. There is one Department of Transportation parcel near the Capitol City Freeway located near the bank protection. It is unknown if the bank protection will encroach into the freeway easement based on the conceptual design. Further refinements will be needed during PED. The remaining lands needed for the construction, operation and maintenance of the Alternative 2 are state, county, city or privately owned.

9. Application of Navigational Servitude to the LERRD's Requirement

The Recommended Plan for erosion/bank protection components meet navigational servitude criteria for rock revetment erosion improvement work completed along the Sacramento and American River (water) side of the levees below the high water mark. The first criterion the federal government must determine is whether the project features serve a purpose in the aid of commerce, navigation, flood control and hydro-electric power. The second step is to determine whether the land at issue is located below the mean or ordinary high water mark of a navigable water course. Construction barges will stay below the ordinary high water mark and the project will not acquire interests in any real property that is already possesses or over which its use or control is or can be legally exercised. Work within the navigable water way will require a permit from the State Lands Commission.

Figure 10. Project Location Map



11. Anticipated Increased Flooding and Impacts

Magpie Creek ARN Reach I – Currently a total of approximately 49 acres on both sides of Raley Blvd. experience flooding during storm events with a 10-year frequency and 70 acres for a 100-year event. The area inundated by a 170-year event with the project in place is estimated to be 72 acres (excluding roadways and channels, the inundated land would be 64 acres). Construction of the proposed improvements would slightly increase the water surface elevation during all flood events greater than a 5 year frequency. During a 170-year event, the increase in water surface is projected to be 0.5 feet at Raley Blvd and 0.1 feet at the western boundary of what was formerly known as the McClellan Business Park. This would increase the inundated area to 78 acres (excluding roadways and channels, 70 acres). Because this is already a floodplain, this project proposes to purchase and preserve the area as floodplain in perpetuity. The proposed project is designed to contain a flood

with a 1 in a 170 chance of occurrence in any given year with 95% reliability. Our sponsors have indicated that they would like to acquire a flowage easement in this area of increased water surface elevations. A physical takings analysis was conducted in December 2000 for Magpie Creek. A final takings analysis will be conducted when the final designs are completed for the Magpie Creek.

Figure 11: Magpie Creek proposed flowage easement general area)



Sac Bypass Reach - Sacramento Bypass Reach is already a designated floodway with executed flowage easements. We will be acquiring additional acreage of flowage easement when we widen the existing bypass. No other increased flooding is anticipated for the project.

12. Cost Estimate

The following is a preliminary analysis estimating the costs of acquiring the required LERRDs to support the NED Plan and the Recommended Plan). There are only two differences between the alternatives. Alternative 2, the LPP, is the Recommended Plan. This alternative costs more than Alternative 1 which is the NED. This Real Estate Plan does not include a detailed description of the Real Estate requirements for Alternative 1 because the features are very comparable between the two

alternatives. This section describes by watercourse the differences, if any, between the two alternatives.

American River North and South Bank: For the American River north and south bank, there is no difference in real estate requirements between the two alternatives.

Natomas East Main Drainage Canal, Arcade Creek, Dry/Robla Creeks, and Magpie Creek: For the Natomas East Main Drainage Canal, Arcade Creek, Dry/Robla Creeks, and Magpie Creek, there is no difference in real estate requirements between the two alternatives.

Sacramento River: For the Sacramento River below the American River, the real estate requirements for seepage, stability, and erosion improvements are identical between the two alternatives. This footprint includes the top half of the levee for seepage and stability improvements as well as the waterside footprint for bank protection construction. On the landside, because of the extent of levee raising is where there is somewhat of a difference between the two alternatives.

Alternative 1 includes approximately 9 miles of levee raising which is being constructed on the landside of the levee. The levee raise is approximately 2 feet, and at a 2 to 1 landside slope, requires four feet of levee easement. In addition to this four feet, an additional 10 feet of access is required for construction purposes. Alternative 2 reduces the extent of levee raising from approximately 9 miles down to below 1. Therefore, Alternative 1 as compared to Alternative 2 has an additional 8 miles of landside real estate take required to accomplish the levee raise required for that alternative. The assumptions used for the reaches of levee raise on the Sacramento River for Alternative 2 were used for the additional 8 miles of levee raising needed for Alternative 1.

Sacramento Bypass: The Sacramento Weir and Bypass widening is not included in Alternative 1 but is in Alternative 2. This feature is fully described in the Real Estate Plan, Section 4, since it is part of the Recommended Plan. The NED, if it were to be fully described in the RE Plan would omit this feature.

In summary, the NED plan, if it were to be fully described in the RE Plan would include a description of approximately 15 feet of landside take (both permanent and temporary) on an additional 8 miles of Sacramento River levee beyond the one mile that is already described in the RE Plan for Alternative 2. The magnitude of these differences are included in the attached tables.

The tables below estimate the costs associated with acquiring real property interests necessary to construct, operate and maintain a local levee project primarily located along the Sacramento and American Rivers within the County of Sacramento. The date of the approved cost estimate was June 11, 2013. The appraiser conservatively estimates the unit costs for the estates required for project purposes and includes several incremental and improvement contingencies for various unknowns including unknowns for level of study definition, unforeseen aspects due to inaccessibility and lack of onsite inspections, cost/value increases from time and development pressure, negotiation latitude above fair market value, potential for excessive condemnation cost/awards, potential for unknowns natural resources or minerals, and improvement/building contingencies.

The below is a summary of Real Estate Costs provided to Cost Engineering:

TABLE 4A NED PLAN COST SUMMARY

Alternative 1 – NED Plan Features	Ownerships	Lands and Damages Includes a Incremental RE Cost 35% and 25 % Severance
-----------------------------------	------------	---

Appendix D - Real Estate Plan

01 ACCOUNT ¹ - LANDS AND DAMAGES (Non Fed)		
Non Federal RE Administrative Costs (1377 parcels)		\$24,039,500
P.L. 91-646 Payment Assistance relocations		\$1,907,000
Subtotal		\$25,946,500
Non-Federal Lands/ Damages	Ownerships	
ARS Sacramento River Reach D	9	\$1,768,000
ARS Sacramento River Reach E	59	\$1,350,000
ARS Sacramento River Reach F	127	\$47,090,000
ARS Sacramento River Reach G	24	\$4,107,000
ARS American River A	4	\$2,434,000
ARS American River B	7	\$519,000
ARS American River C	6	\$458,000
ARN American River A	8	\$1,444,000
ARN American River B	2	\$96,000
ARN American River C	2	\$326,000
ARN American River D	28	\$835,000
ARN American River E	41	\$1,228,500
ARN American River F	3	\$340,000
ARN American River G	12	\$149,000
ARN American River I (Magpie)	30	\$29,580,000
Ownership Total	362	
Subtotal Lands and Damages + (Non Federal Admin)		(Rounded) \$91,724,500
Total		\$25,946,500
Federal RE Admin Costs		(ROUNDED) \$9,582,000
	Sub total	(ROUNDED) \$127,253,000
02 ACCOUNT - RELOCATIONS		
*Utility/Facility Relocation Costs		\$101,612,000
Contingency 28.6 %		\$27,435,000
Total:		\$129,048,000
TOTAL LERRD'S COSTS (01 AND 02 ACCOUNTS)		(ROUNDED) \$256,301,000

Note - Total Project Cost Summary displayed in Cost Engineering Appendix will include accounts 30 and 31 for all relocations and construction items combined.

TABLE 4B RECOMMENDED PLAN COST SUMMARY

Alternative 2 –Recommended Plan Features	Ownerships	Lands and Damages Includes a 35% Incremental RE Cost and varying Severance Damages
01 ACCOUNT ¹ - LANDS AND DAMAGES (Non Fed)		
Non Federal RE Administrative Costs		\$24,967,975
P.L. 91-646 Payment Assistance relocations		\$690,625
Subtotal		\$25,658,600
Non-Federal Lands/ Damages		
ARS Sacramento River Reach D	9	\$880,000
ARS Sacramento River Reach E	59	\$1,190,000
ARS Sacramento River Reach F	128	\$14,370,000
ARS Sacramento River Reach G	20	\$2,758,000
ARS American River A	4	\$2,434,000
ARS American River B	7	\$519,000
ARS American River C	6	\$458,000
ARN American River A	8	\$1,444,000
ARN American River B	2	\$96,000
ARN American River C	2	\$326,000
ARN American River D	28	\$835,000
ARN American River E	41	\$1,228,500
ARN American River F	3	\$340,000
ARN American River I (Magpie)	30	\$29,580,000
Sac Bypass Widening	10	\$4,000,000
Subtotal Lands and Damages + (Non Federal Admin)		(Rounded) \$60,458,400
Total	369	\$25,658,600 \$86,117,000
Federal RE Admin Costs		(Rounded) \$9,216,000
		\$95,333,000
02 ACCOUNT - RELOCATIONS		
*Utility/Facility Relocation Costs		\$122,813,000
Contingency 29.6%		\$34,368,000
Total:		\$157,201,000
TOTAL COSTS (01 AND 02 ACCOUNTS)		\$252,534,000

* Note - Total Project Cost Summary displayed in Cost Engineering Appendix will include accounts 30 and 31 for all relocations and construction items combined.

13. Relocation Assistance Benefits (PL 91-646)

In addition to Real Estate administrative costs the relocation assistance payments to the property owners is calculated separately. A Relocation Assistance Plan will be provided to the Corp for review by the non federal sponsors. Relocation is dealt with on a case by case basis and costs will vary. Real Estate costs include totaling the land value, improvement value, and severance damages. This inventory of potential full take relocations was based on a >10 percent conceptual design and actual relocations can decrease or be eliminated in design phase. This inventory is for planning purposes only to assist in the development of total project cost for relocation assistance costs. It is estimated for the Recommended Plan that approximately 17 structures will be impacted due to construction of the project. The relocations include 13 residential takes, 2 temporary marina relocations, and 2 commercial building takes.

TABLE 5 RELOCATIONS

Locations	Reach	Number of Structures	Relocation Assistance Payments
American River South	Reach E	1	\$32,500
American River South	Reach F	8	\$260,000
American River South	Reach G	8	\$260,000
		25% contingency (\$138,125)	Total = \$690,625

Availability of Replacement Housing/Business Properties: There are currently hundreds of single family homes for sale in Sacramento County. At this time there is replacement housing available. There are hundreds of businesses for sale or lease available in Sacramento County as well.

The foregoing impacts and estimates relating to potential displacements, and the anticipated need to provide relocation assistance benefits, are provided exclusively for project cost estimating purposes only and are not intended to be relied upon for provision of benefits and/or the payment of the estimates referenced herein. A draft relocation assistance plan has been provided by the State of California, Department of Water Resources and will be refined during final designs.

14. Mineral/Timber Activity

There are no active timber harvesting or mineral activities currently along the American or Sacramento River along the levees in our project area at this time.

15. Non-Federal Sponsor's Ability to Acquire

The State of California, Central Valley Flood Protection Board, have partnered with the Corps on several prior projects and have a full Real Estate staff capable of fulfilling their responsibilities as the non-Federal sponsor. The State of California, Central Valley Flood Protection Board, have a local partnership agreement with Sacramento Area Flood Control Agency who participate in this project as well.

16. Zoning Anticipated in Lieu of Acquisition

The Corps does not propose use of a zoning ordinance that would essentially facilitate property acquisition by prohibiting certain uses of property instead of purchasing the property. No such ordinance is proposed. The plan assumes purchasing property along the levee.

17. Acquisition Schedule

For economic and construction assessment, it was assumed that once authorized the project would receive annual appropriations ranging from \$154M to \$177M for construction of the selected plan. The Sponsor cost share was assumed to range from \$54M to a maximum of \$77M (applied to LERRD's) with \$100M as the yearly allotment for the PED and Construction.

The non-Federal sponsors will be directed to begin real property acquisition for the project only after the PPA is fully executed. A risk letter has been sent from the Corps to both the Sacramento Flood Control Agency and the State of California alerting them to the risks associated with purchasing project lands in advance of the PPA execution. The construction contracts extend out ten years. Durations of each tasking after the PPA is executed is estimated at 3 to 6 months per construction contract.

Table 6. Real Estate Acquisition Schedule

REAL ESTATE ACQUISITION SCHEDULE				
Project Name: American River Common Features General Evaluation Report	COE Start	COE Finish	NFS Start	NFS Finish
Receipt of preliminary drawings from Engineering	2011	2015		
Receipt of final drawings from Engineering	2019	2020		
Execution of PPA/Finalize Chief's Report	April 21, 2016			
Formal transmittal of final drawings & instruction to acquire LERRDS (Assumes 4-5 years before appropriations and authorities are in place for PED phase of Project)	2016	2016	2016	2018
Construction Contracts (Reach ARS F) Years 1 to 6 (Reach ARS E) Years 4 to 7 (Reach ARS A) Years 1 to 4 (Reach ARS G) Years 4 to 9 (Reach ARS D) Years 7 to 10 (Reach ARS B) Years 4 to 5 (Reach ARN A) Years 5 to 7 (Reach ARS C) Years 7 to 8 (Reaches ARN D) Years 4 to 8 (Reaches ARN B) Years 8 to 9 (Sacramento Bypass Widening) Years 1 to 7 (Reach ARN F) Years 7 to 10 (Reach ARN E) Years 5 to 10 (Reaches ARN C, G, I) Years 8 to 10	2018 2021 2018 2021 2024 2021 2022 2024 2021 2025 2025 2026 2018 2024 2022 2025	2023 2025 2021 2026 2027 2022 2024 2025 2025 2026 2024 2027 2027 2027		
Conduct Landowner Meetings			2018	2027
Prepare/review mapping & legal descriptions			2018	2027
Obtain/review title evidence			2018	2027
Obtain/review tract appraisals			2018	2027
Conduct negotiations			2018	2027
Prepare/review condemnations			2018	2027
Perform condemnations			2018	2027
Obtain control			2018	2027
Complete/review PL 91-646 benefit assistance			2018	2027
Certify all necessary LERRDS are available for construction			2018	2027
Prepare and submit credit requests			2018	2027
Review/approve or deny credit requests	2020	2030		
Establish value for creditable LERRDS	2020	2030		

18. Description of Facility and Utility Relocations

On July 14, 1998, the Assistant Secretary of the Army issued a letter directive relating to the American River Common Elements Project which provided, in relevant part, that the removal and replacement of a utility, or other public facility, owned by the State of California, or a political subdivision thereof, (including the Sacramento Area Flood Control Agency (SAFCA) and its constituent members) and which delivers public services, should be treated as a relocation where such work is required as a direct result of the construction of the project. Such relocations, provided they met the required criteria, were to be included as a shared total project cost with credit issued to the non-federal sponsors for relocating the affected utilities/facilities. This letter applied only to publically owned utility and facilities and did not include any privately owned permitted or unpermitted encroachments.

Due to the passage of time and the current scope of the project—now known as the Common Features project—Corps RIT Vertical Team agreed that ongoing reliance upon the scope of the ASA’s 1998 letter and its application to the current project must be coordinated with the current ASA-CW. Provided agreement is reached and assuming consistency with the preliminary findings set forth in the Relocation Inventory Tables, below, costs incurred in relocating eligible utilities/facilities that are owned by the following entities will be included as total project costs with credit given to the non-federal sponsors: the State, SAFCA and its constituent members (which include the City of Sacramento, the Counties of Sacramento and Sutter, Reclamation Districts, the American River Flood Control District, the Sacramento County Water Agency and the Sutter County Water Agency) and the Sacramento Municipal Utility District (SMUD). This letter is located in Exhibit C.

The Corps has drafted modifications to the Project Partnership Agreement for the Common Features Project implementing this determination. These modifications and implementation guidance have been provided to the Sacramento District for coordination with the State of California and SAFCA.

A Preliminary Opinion of Compensability was prepared regarding proposed utility/facility relocations based upon information and data submitted to the Sacramento District Real Estate Division Office for review as of September 4, 2014. Various utilities/facilities are located within the project boundaries and must be relocated to facilitate project construction. The utilities/facilities consist of electrical distribution and service facilities, telephone communication lines, irrigation facilities, roadways, water delivery facilities and natural gas pipelines. A summary of their compensability analysis, referencing the data set forth in the Relocation Inventory Table, is as follows:

The following utilities/facilities are compensable relocations under the 1998 ASA letter and have demonstrated need for the provision of “substitute facilities.” Exhibit E provides the table with the utility/facility inventory.

For Relocations, utilities and various encroachments were researched and identified using a variety of sources including: State DWR Levee Logs, USACE Periodic Inspection data, and Central Valley Flood Protection Board (CVFPB) permitting data. All of these sources were compiled into a central spreadsheet for organization and priority identification purposes. Field surveys were conducted following the research in an attempt to verify description, materials and sizes. Typical fixes were created to reflect existing conditions and proposed improvements to accommodate levee construction features and USACE policy compliance. Features such as replacement/relocation of

pipe, impervious fill around pipes, and positive closure represented a majority of the reoccurring items requiring relocation. Exhibit E provides the table with the utility/facility inventory.

Utility Power Poles-ARS Reach D Item 28, ARS Reach E Item 35, ARS Reach F Item 44, ARS Reach G Item 44, ARN Reach E Item 35, ARN Reach G item 82, Sac Bypass Reach Items 7, 11
Discharge Pipes/Storm Drains/Intake Pipes/Culverts/City Sumps/- ARS Reach D Items 2, 6,7,11,12,19,24,26, ARS Reach E Items 30, 31,32,33, ARS Reach F Items 36, 37,41 ARS Reach G Item 50,ARN Reach C Item 1,4 ARN Reach D Item 12,19 ARN Reach E Items 39,44,57,60,61,62, ARS Reach G Item 83, ARS Reach H 98, 100, 101, Sac Bypass Items 9, 10
Force Main/ Sewer pipes/Water Main- ARS Reach D Items 16, 21, 23 ARS Reach E Item 34 ARS Reach G Item 52, 59, ARN Reach D Items 14, 17,18,20,24 ARN Reach E Items 38,42,43,45,49,63,64 ARN Reach G Item 94
Electrical Conduits/Electrical Pipes ARS Reach D Items 20,25, ARS Reach F Item 38, ARS Reach G Item 57, ARN Reach D Item 21, ARN Reach E Item 46
Gas Mains – ARS Reach G Item 51
Telecommunications ARS Reach G item 48, ARN Reach D Item 11, Sac Bypass Item 8
Gaging Station – Sac Bypass Reach Item 2
Railroads ARS Reach G, Remove and replace tracks 11,050 LF, ARS Reach D, Sacramento Bypass (replace rail road bridge over weir- construction cost not a relocation)
Roads – Restoring public and private haul routes if damaged back to their existing condition or replace new if needed. Levee access ramp repairs if needed. ARS Reaches A,B,C,D,E,F,G ARN Reaches A,B,C,D,E,F,G,I Description of road work located in MII report level 3, Exhibit E.

The following utilities/facilities have no public purpose or ownership and, accordingly, are not compensable relocations: All of these items are various pipe penetrations through levees the majority of which have been abandoned and are no longer needed. There is one electrical conduit and one communications conduit that are proposed to be cut and abandoned and no longer appear to be in use ARS Reach D: Item Nos. 1, 8-10, 14, ARS Reach F 39,40 ARS Reach G, Item Nos. 45- 46,47, ARN Reach C Item Nos. 2

The following utilities/facilities may have compensable interests under the 1998 ASA letter, however, there is insufficient information at this time to make a preliminary determination as to whether the utilities/facilities are compensable relocations doctrine. The submission of additional data such as ownership and public purpose is required.

ARS Reach D Nos. 3,4,27(storm drain, man hole and a culvert, ARS Reach E Nos. 29(multiple pipes near La Rivage marina), ARS Reach G: Item Nos. 58, 60, 61, (pump, pipe, electric feed), railroad stop log closure structure raise, railroad tracks remove and replace 11,050 LF – MII page 18, ARN Reach D: Item Nos. 9, 22, 28, 29(2 overhead utilities, man hole, culvert), Page 7 MII, ARN Reach E, Item Nos. 35, 47, 52, 53, 55, 56, 58, 59 (five storm drains and three overhead utilities) ARN Reach F, Item Nos. 66, 67 69, 70, 72, 73, 75, 76 (two drop inlets, four culverts, two overhead utilities) ARN Reach G: Item Nos. 80, 84, 85, 86, 87,90, 91, 92 95, 96, 97(four overhead utilities, five culverts, water well and a manhole) ARN Reach H, Item Nos. 99,102 (two overhead utilities) ARS Reaches A,B,C,D,E,F,G and ARN Reaches A,B,C,D,E,F,G,I (haul route surface road repairs/asphalt repairs, ramp repairs)

A utility inventory is provided below by basin and reach. A summary table of the cost estimate is provided and includes construction costs and engineering contingency. Utility/Facility relocation inventory with detailed unit costs are shown in Exhibit E. For cost estimating purposes the utilities were all assumed compensable.

TABLE 7. CODE OF ACCOUNTS 02 UTILITY/FACILITY RELOCATIONS SUMMARY

UTILITY/FACILITY RELOCATIONS	COST
ARS Reach A	\$4,899,000
ARS Reach B	\$2,313,000
ARS Reach C	\$400,000
ARS Reach D	\$25,524,000
ARS Reach E	\$4,143,000
ARS Reach F	\$11,421,000
ARS Reach G	\$26,383,000
ARN Reach A	\$1,972,000
ARN Reach B	\$81,000
ARN Reach C	\$1,180,000
ARN Reach D	8,344,000
ARN Reach E	\$10,665,000
ARN Reach F	4,237,000
ARN Reach I	\$50,000
Sac Bypass Widening	\$21,201,000
Subtotal	\$12,281,3000
Contingency 28%	\$34,368,000
Total	\$157,201,000

Total Project Cost Summary provided by Cost Engineering Section will include accounts 30 and 31 for all relocations and construction items combined.

ANY CONCLUSION OR CATEGORIZATION CONTAINED IN THIS REAL ESTATE PLAN (AND THE REPORT) THAT AN ITEM IS A UTILITY OR FACILITY RELOCATION TO BE PERFORMED BY THE NON-FEDERAL SPONSOR AS PART OF ITS LERRD RESPONSIBILITIES AND/OR IS OTHERWISE COMPENSABLE OR NON-COMPENSABLE IS PRELIMINARY AND FOR DISCUSSION PURPOSES ONLY. THE GOVERNMENT WILL MAKE A FINAL DETERMINATION OF THE RELOCATIONS NECESSARY FOR THE CONSTRUCTION, OPERATION, OR MAINTENANCE OF THE PROJECT AFTER FURTHER ANALYSIS AND COMPLETION AND APPROVAL OF THE FINAL ATTORNEY'S OPINIONS OF COMPENSABILITY FOR EACH OF THE IMPACTED UTILITIES AND FACILITIES DURING FINAL DESIGNS.

19. Hazardous, Toxic, and Radiological Waste Impacts

A Phase 1 Environmental Site Assessment was performed in accordance with the scope and limitations of ASTM E 1527-05 and USACE ER 1165-2-132 for the American River Common Features GRR project. Any exceptions to, or deletions from, these practices have been outlined within the report. There are many contaminated properties adjacent to the levees on the dry side that are considered to be avoidable due to the nature of the contamination or the nature of the work proposed on the levees. This assessment has identified sites with recognized and probably unavoidable environmental conditions at the locations shown in Table 7 below.

TABLE 7. Sites with Recognized Environmental Conditions

Site Name	Location	Reach	Issue
1 - Full Stop Mini Mart EDR 41-5	251-0292-016 3200 Rio Linda Blvd. Sac CA 95815	ARN Arcade Creek	TPHg plume at levee bridge crossing with air sparging
2 - Old North Sacramento EDR 69-8	275-0111-001 EDR 69-8	ARN Reach B/N Natomas East Main Drainage Canal	CVOC, TPH Groundwater Plumes adjacent to levee, multiple properties
3 - TOSCO Corp. Conoco-Phillips Sacramento Terminal EDR 174-11	009-0020-001 66 Broadway Sac CA 95818	ARS_D	Petroleum release site on wet side of the levee.
4 -TOSCO Corp./ Conoco-Phillips Sacramento Terminal EDR 174-11	76 Broadway Sacramento, CA 95818	ARS_D 009-0030-054 009-0012-071 009-0012-072	Petroleum release site on dry side of the levee. Petroleum pipelines pass through the levee.
5-Robertson Harbor Sand & Gravel EDR 92-8 EDR 128-8	001-0160-001 200 28 th Street Sacramento CA	ARS Reach B American River	Levee Encroachment, recycled pavement
6 -Southern Pacific Rail Yard Museum EDR 120-7	501 Jibboom St. Sacramento CA 95814	ARS Reach D Sac River	CVOC, TPH Groundwater Plume, land use restrictions
7 - Old Bryte Yard Landfill EDR Site 79-6	042-280-011 50035 County Rd 126 West Sac, CA 95691	Sacramento Bypass	Lead in Soil

The historical land uses of the region may also contribute to residual contamination of the entire project area with agricultural fertilizers, herbicides, and pesticides as well as arsenic and mercury from mining operations in the region. Additional sampling will be required during subsequent investigations to determine if project areas have been impacted by these historical contaminants.

On-line records are limited. For contaminated sites identified as unavoidable under the alternatives considered by the American River Common Features GRR, a public records review is recommended at the Central Valley Regional Water Quality Control Board office and the Sacramento Regional Office of the Department of Toxic Substances Control as the next step to determine if additional investigation is required to determine the impact of these sites on the project. Current groundwater plume maps and environmental liens / deed restrictions incorporating land use controls are particularly needed. Emphasis is needed on the Sacramento Terminal bulk fuel handling facility, the old Southern Pacific rail yard, and the old Bryte yard landfill.

The subsequent Phase 1 ESA(s) during Design Phase will investigate if new sites have emerged and if existing sites still pose a threat to planned construction.

If any evidence of potential HTRW is found during construction, all work would cease, and the Corps and non-Federal sponsor would be notified for further evaluation of the potential contamination. Any unanticipated hazardous materials encountered during construction would be handled according to applicable federal, state, and local regulations. The Corps would require that a contingency plan that outlines steps to be taken before and during construction activities to document soil conditions, as well as procedures to be followed if unexpected conditions are encountered, be prepared by the contractor.

The non-Federal sponsor is responsible for 100 percent of the cost to develop the clean-up procedures (remedial action plan) and to treat the contaminants in place or relocate the material (ER 1110-2-1150).





HTRW – FIGURE 11 ARS Reach B(5)/C Asphalt Concrete Recycling Company encroaching on the levee between Sacramento City Landfill/Sutters Landing Regional Park and Scollan/Old Sacramento Landfill



HTRW FIGURE 12 -ARN Reach N (2) Full Stop Mini-Mart SVE/AS treatment system located adjacent to levee



HTRW FIGURE 13 - ARS Reach C Monitoring well cluster in the levee crown near Martin Sprocket & Gear



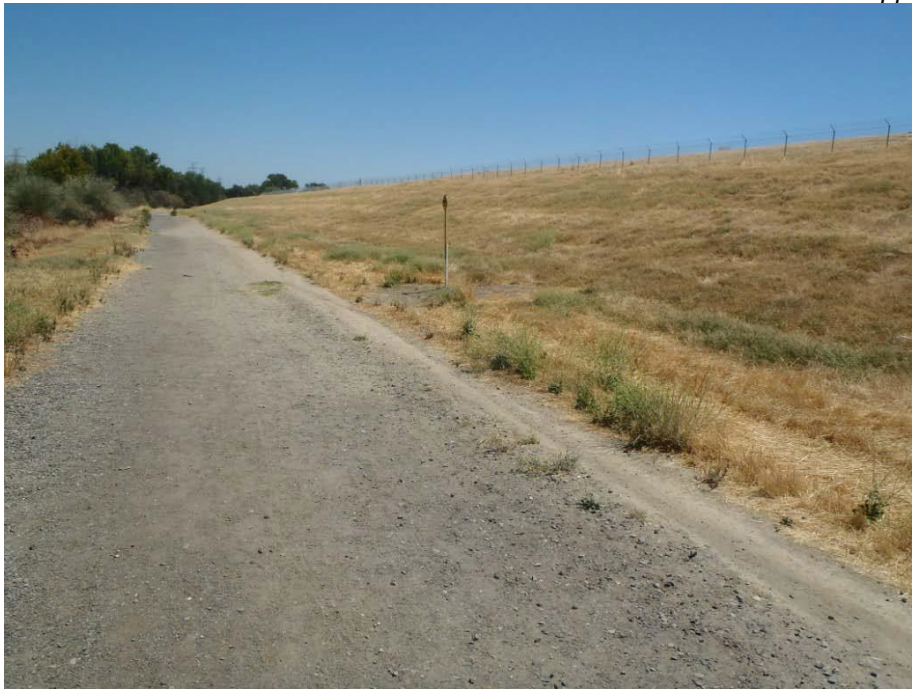
HTRW FIGURE 14 -Old Bryte Landfill adjacent to Sacramento Bypass (7) north levee.



HTRW FIGURE 15 -Monitoring well between Old Bryte Landfill and Sacramento Bypass levee (7)



HTRW FIGURE 16 -ARN Reach N/I Contaminated property in old North Sacramento viewed from Dry Creek levee



HTRW FIGURE 17 - ARS Reach B(5) Kinder Morgan Energy Partners buried petroleum pipeline warning sign at the toe of the levee at Sacramento City Landfill /Sutter Landing Regional Park



HTRW FIGURE 18 -ARS Reach B (5)/C Sacramento City Landfill rises above levee crown in the left side of the photo. Stormwater collection drain is visible. Landfill gas collection system is obscured by the weeds.



HTRW FIGURE 19 -ARS Reach D (6) This former PG&E manufactured gas plant site is currently under remediation. Contamination has been solidified in place at the foot of the levee. Remediation is planned to be completed in November 2012. Active railroad tracks are also present on top of the levee in this area.



HTRW FIGURE 20- ARS Reach D (6) This site is owned by the Sacramento Redevelopment Agency and is next door to the PG&E site. The site has been certified by DTSC and has various land use restrictions. Currently, the site is used for horse carriage storage. Some empty drums are stored on site.



HTRW FIGURE 21 -ARS Reach D 66 Broadway (3) is a fuel terminal used by TOSCO Corporation. The site is located on the water side of the levee. A petroleum release that is still undergoing cleanup occurred in this area. Underground utilities and monitoring wells are present.



HTRW FIGURE 22 - ARS Reach D 76 Broadway (4) is a bulk fuel terminal used by Conoco Phillips. Underground infrastructure and at least 7 above ground storage tanks containing petroleum substances are located on both sides of the levee.



HTRW FIGURE 23- ARS Reach D (4) Fuel lines cross through the levee at 76 Broadway.



HTRW FIGURE 24 -ARS Reach D 2420 Front St This bulk fuel terminal used by Chevron is on the water side of the levee. Monitoring wells, underground infrastructure, and at least 12 above ground storage tanks containing petroleum substances were observed on site.



HTRW FIGURE 25- ARS Reach D (3&4) Fuel lines cross to and from the water and land sides of the levee to the following sites: 76 Broadway (ConocoPhillips Bulk Fuel Terminal), 66 Broadway (TOSCO Corp Sacramento Terminal), and 2420 Front St (Chevron Bulk Fuel Terminal).

20. Attitude of Land Owners

To date, the results of the outreach program from the public scoping meetings have been favorable, constructive, and supportive with the exception of the construction of the levee access corridor by residents and businesses along the Sacramento River particularly in the Pocket areas. Lands adjacent to the existing levees have been developed for several decades. The proposed plan will fix the existing levees in place in order to minimize additional land requirement.

In an effort to partner with our sponsors and minimize impacts to the public a System Wide Improvement Framework Policy (SWIF) will allow specific vegetation and/or encroachments to remain in place permanently or defer their resolution to some future date. A SWIF provides committed sponsors the opportunity to transition their levees over time to USACE standards. By using a SWIF, sponsors can prioritize deficiencies to address the highest risk first to achieve system-wide risk reduction and to meet current engineering standards, vegetation and encroachment issues (including landside levee access) in the study area. This will be resolved through a combination of construction actions associated with implementation of the recommended plan and formal agreements.

21. Cultural Resource Sites

Records searches of pertinent cultural resource information were conducted in 2006 and

2007, and updated in 2010 and 2013 for the overall study area. Most of the searches were conducted at the North Central Information Center (NCIC) of the California Historical Resources Information System, located at California State University, Sacramento. The NCIC records search covered portions of the study area in Sacramento and Yolo Counties. The northern portion of the Natomas area is within Sutter County so records searches for that area were also conducted at the Northeast Information Center (NEIC). The NEIC reported seven previous cultural resource studies in the study area within Sutter County, and the NCIC reported 278 previous studies in the Sacramento and Yolo County portions of the study area; thus a total of 285 studies have been conducted in the study area. From those previous studies, a total of 175 cultural resources (archaeological and historical sites) were identified within the overall study area.

Due to the large geographic scope of the study area, limitations in access, the alluvial nature of the watershed, because levees and other structures have been built on top of much of the original native soil of the study area, and due to the high potential for buried cultural resources that will not be discovered until during construction, a 100% pedestrian survey of the entire study area could not be completed. However, data from the records and literature search, concerns relayed by American Indians, knowledge of the prehistory and history of the study area, and recent archaeological surveys conducted as part of Natomas Levee Improvements Project provide information on the types of cultural resource sites that may be found within the study areas. The known cultural resources within the study area can be categorized as the following general types within the Sacramento Valley:

- **Mounds** – Refers to relatively low natural or anthropogenic mounds occupied by Native Americans as habitation sites and burial locations. Discarded refuse and numerous fires frequently generated significant accumulations of midden soil on these features.
- **Midden** – Refers to prehistoric or proto-historic trash deposits containing food refuse, such as discarded bone, shell, and other organic matter; along with broken, discarded or lost artifacts made of various raw materials, including stone, wood, bone, antler, etc. The organic nature of middens tends to produce softer, darker, and greasier soils in contrast to the natural soils on which they rest. Deposition of midden often expanded the size of natural knolls or mounds both horizontally and vertically. Because of the softer soils in middens, they were also used as locations for human and/or animal burials. Middens generally include the full suite of artifacts, materials, and remains that would be encountered in a lithic scatter.
- **Lithics/Lithic Scatter** – The term “lithic scatter” refers to scatters of lithic (stone) debris (or debitage) resulting primarily from manufacture of chipped stone tools such as knives, dart points, arrow points, scrapers, adzes, and other tools. The process of manufacture by chipping or “knapping” resulted in percussion and pressure flakes removed from the raw natural resources of chert, obsidian, basalt, felsite and any other stone raw materials. Lithic scatters often contain fire-cracked rock distinguished by its fire reddened colors and sharp fracture patterns. Such rocks were often used for cooking by dropping heated rocks into baskets full of water and food. The sudden temperature change would commonly cause the rocks to fracture in a distinctive way. Ground stone tools used for processing foods and pigments are also common in lithic scatters. Less commonly, baked clay artifacts and shell or bone tools and ornaments may also occur. Finally, broken fragments of tools used for lithic manufacture such as hammerstones may also be associated with lithic scatters.
- **Traditional Cultural Properties** – Often referred to as “TCPs,” Traditional Cultural Properties may be geographic features, locations, rural communities, urban neighborhoods, or other areas associated with cultural practices or beliefs of a living community that are rooted in that community’s history, and are important in maintaining the continuing cultural identity of the community. TCPs may include locations associated with the traditional beliefs of a Native American group about its origins, its cultural history, or the nature of the world; may include buildings and structures, objects or landscapes; and may be associated with religious or

cultural practices of Native Americans.

- **Traditional Cultural Landscapes** – As described by the Advisory Council on Historic Preservation (ACHP), the term “traditional cultural landscape” has not been formally defined by the National Park Service. Although there is no single defining feature or set of features that comprise a traditional cultural landscape, such places could be comprised of natural features such as mountains, caves, plateaus, and outcroppings; water course and bodies such as rivers, streams, lakes, bays, and inlets; views and view sheds from them, including the overlook or similar locations; vegetation that contributes to its significance; and manmade features including archeological sites; buildings and structures, circulation features such as trails; land use patterns, evidence of cultural traditions, such as petroglyphs and evidence of burial practices; and markers or monuments, such as cairns, sleeping circles, and geoglyphs.
- **Historic Debris** – This term may refer to a great number of different artifacts 50 years of age or older that may be considered historical in nature. Cans, metal fragments, nails, glass fragments, glass bottles, and a variety of remnant material may be considered historic debris. In the Sacramento Valley this occasionally includes material thrown from railroad cars as passengers passed through the area, as well as abandoned machinery and equipment. Historic debris may be linked to a number of different historic subsistence activities such as farming, irrigation, construction of infrastructure, mining, and homesteading.
- **Water Related** – The history of the Sacramento Valley is intertwined with that of flood control, reclamation, farming, and irrigation in the city of Sacramento and the surrounding areas. Much of the flood control infrastructure of the area dates back to the turn of the twentieth century. Water-related features may include levees, canals, weirs, bypass channels, drainage ditches, pump houses, wells, pipes, and farm-related structures and equipment.
- **Transportation** – A great number of roads, bridges, railroad tracks, and railroad trestles appear within the study area. These may include dirt or paved roads; bridges over canals, culverts, or other topographic features; and a variety of railroad features. Railroad features may include portions of the Transcontinental Railroad, the Walnut Grove Branch Line Railroad, raised berms that supported railroad rights-of-way, railroad trestle bridges, and lengths of railroad alignments. Within Sacramento, a number of historic railroad features are still in use today, both for the transport of goods, and recreationally and educationally associated with the California Railroad Museum in Old Town Sacramento just east of the Sacramento River.
- **Structures** – This refers to a variety of buildings or structures 50 years of age or older. Within the project area these may include government offices, farmsteads, homesteads, residential structures, barns, ranches, power plants, and sheds. These structures may be made from materials such as wood, concrete, brick, masonry, stucco, and corrugated metal.

In addition to the conclusions regarding the various cultural resources site types that may be found within the study area, an archaeological sensitivity assessment for prehistoric resources was conducted. The sensitivity assessment was built using existing survey data to identify correlations between the occurrence of archaeological sites and environmental variables including proximity to water, historic vegetation, and lithology. This was accomplished in GIS using environmental data and information from the record search indicating where archaeological sites do and do not exist in areas that had been previously surveyed.

As a result of the various efforts (records and literature searches, archaeological sensitivity assessment, consultation with American Indians, consultation with the interested public, review of existing and recent archaeological inventories and discoveries) to identify cultural resources within the study area, the Corps has determined that the project will likely have an adverse effect on properties that are either included in, or are eligible for inclusion in the NRHP. Due to the large geographic scope of the project, the lack of detailed designs to determine construction specific APEs, and limitations in available funding to complete full identification of potential historic

properties prior to approval of the project, the Corps has also determined that they cannot fully determine the effects of the project on NRHP eligible properties for all phases and segments of the project at this time.

In order to provide a framework for the Corps to identify cultural resources, evaluate cultural resources for their eligibility for inclusion in the NRHP, determine possible effects to historic properties, and mitigate effects to historic properties as a result of the project, a programmatic agreement (PA) has been developed by the Corps in consultation with the State Historic Preservation Officer (SHPO) the Advisory Council on Historic Preservation (ACHP), and Native American tribes with concerns in the area as potential Concurring Parties. The draft PA was provided to the DWR, the CVFPP, SAFCA, and potentially interested American Indians for review and comment in the development of the PA. Specific individual determinations of effect for historic properties that may be affected by the selected alternative would be completed under the stipulations of the PA, which includes a framework to identify historic properties, evaluate NRHP eligibility, and assess effects.

The PA covers the ARCF Project. The PA provides a process for the identification and evaluation of historic properties and, if necessary, the resolution of adverse effects to identified historic properties. The PA also provides a process for handling post-review discoveries. Per the PA, all Corps construction activities will avoid archaeological sites/historic properties, both eligible and non-eligible, to the maximum extent practicable. Per the PA, all Corps construction activities will avoid historic properties to the maximum extent practicable. The draft PA was provided to DWR and the CVFPB on April 11, 2012 and February 22, 2013, and to SAFCA on February 12, 2013, and potentially interested Native Americans on April 5, 2013, June 6, 2013, June 12, 2014, and June 25, 2014 for review and comment as part of the development of the PA. The final PA was executed by signature by the Corps and the SHPO on September 10, 2015.

EXHIBIT A

ASSESSMENT OF NON-FEDERAL SPONSOR'S REAL ESTATE ACQUISITION
CAPABILITY
AMERICAN RIVER COMMON FEATURES GENERAL REEVALUTION STUDY

SPONSORS: The State of California, Central Valley Flood Protection Board (CVFPB) with the USACE and the local agreement between State of California, CVFPB and Sacramento Flood Control Agency (SAFCA)

I. Legal Authority:

- a. Do the sponsors have legal authority to acquire and hold title to real property for project purposes? Yes CVFPB; Yes SAFCA
- b. Do the sponsors have the power of eminent domain for this project? Yes CVFPB; Yes SAFCA
- c. Do the sponsors have "quick-take" authority for this project? Yes CVFPB; Yes SAFCA
- d. Are any of the lands/interests in land required for the project located outside the sponsor's political boundary? No CVFPB; No SAFCA
- e. Are any of the lands/interests in land required for the project owned by an entity whose property the sponsor cannot condemn? No CVFPB

II. Human Resource Requirements:

- a. Will the sponsor's in-house staff require training to become familiar with the real estate requirements of Federal projects including P.L. 91-646, as amended? Yes CVFPB;
- b. If the answer to a. is "yes," has a reasonable plan been developed to provide such training? Yes CVFPB
- c. Does the sponsor's in-house staff have sufficient real estate acquisition experience to meet its responsibilities for the project? Yes CVFPB; Yes SAFCA
- d. Is the sponsor's project in-house staffing level sufficient considering its other workload, if any, and the project schedule? Yes CVFPB; Yes SAFCA
- e. Can the sponsor obtain contractor support, if required, in a timely fashion? Yes CVFPB; Yes SAFCA

Prepared by:

Laurie Parker

Laurie Parker
Realty Specialist
Acquisition Branch

Date: 25 November 2015

Reviewed and Approved by:

Diane Simpson
Chief, Real Estate Division
U.S. Army Engineer District,

Sacramento

Date: _____

EXHIBIT B POLICY GUIDANCE LETTER 31- REAL ESTATE SUPPORT TO PLANNING
PARADIGM (3x3x3)



DEPARTMENT OF THE ARMY
U.S. ARMY CORPS OF ENGINEERS
441 G STREET NW
WASHINGTON, D.C. 20314-1000

REPLY TO
ATTENTION OF:

CEMP-CR

JAN 10 2013

MEMORANDUM FOR SEE DISTRIBUTION

SUBJECT: Real Estate Policy Guidance Letter No. 31-Real Estate Support to Civil Works Planning Paradigm (3x3x3)

1. References.

- a. Memorandum, CECW-CP, 8 February 2012, Subject: U.S. Army Corps of Engineers Civil Works Feasibility Study Program Execution and Delivery
- b. ER 5-1-11, USACE Business Process, 1 November 2006
- c. EC 405-1-04, Appraisal, 30 Dec 2003
- d. ER 1105-2-100, Planning Guidance Notebook, 22 Apr 2000
- e. ER 405-1-12, Chapter 12, Real Estate Roles and Responsibilities for Civil Works, Cost Shared and Full Federal Projects, Change 31, 1 May 1998

2. Purpose. In accordance with reference a, this memorandum provides interim policy and guidance for real estate efforts associated with feasibility studies under the new Planning Paradigm, "SMART Planning," and the 3x3x3 rule. In accordance with the 3x3x3 rule, all feasibility studies should be completed within three years, at a cost of no more than \$3 million, utilize three levels of vertical team coordination, and be of a "reasonable" report size.

3. Background. Real Estate has been fully engaged in the implementation of the 3x3x3 by actively participating in each webinar, the planning modernization workshop, and serving as part of the HQ Transition Team. In accordance with references b-e, Real Estate involvement is essential to the development and implementation of any pre-authorization project. Paragraph 12-16 of reference e. outlines the significant topics that must be covered in a real estate plan (REP). The level of detail necessary to apply the requirements of real estate policy and guidance will vary depending on the scope and complexity of each project.

As outlined in Chapter 12, the minimum interests in real property necessary to support various types of projects must be identified. As projects are scoped at the beginning of the feasibility phase (via a Charette or other forum), it is essential that Real Estate become familiar with the project authority and purposes to make a determination of the minimum interests and estate(s), both standard and non-standard, necessary as projects are scoped and alternatives evaluated. If a

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SUBJECT: Real Estate Policy Guidance Letter No. 31-Real Estate Support to Civil Works Planning Paradigm (3x3x3)

non-standard estate will be needed, this should be discussed with MSC and HQ Real Estate as early as possible to ensure that the justification is sound and will serve the project purpose.

4. Policy. Typically, the attorney's preliminary opinion of compensability and gross appraisals are two areas that require more detail than may be readily available during the start of the feasibility phase, and are critical to determination of accurate estimates for real estate and total project costs. Due to the focus on 3 years or less for study duration, it will be essential for Real Estate to be adaptable and scale its requirements, decision making, and risk management in proportion to the significance of total project costs.

a. Gross Appraisals:

Specific to gross appraisals, EC 405-1-04 provides that cost estimates are utilized for preliminary planning of projects and in other cases, brief gross appraisals are acceptable. For purposes of the feasibility phase, the detail will vary as outlined below.

- (1) For projects in which the value of real estate (lands, improvements, and severance damages) are not expected to exceed ten percent of total project costs (total cost to implement project), a cost estimate (or rough order of magnitude) will be acceptable for purposes of the feasibility phase.
- (2) For projects in which the value of real estate (lands, improvements, and severance damages) do not exceed 30 percent of total project costs (total cost to implement project), a brief gross appraisal will be acceptable for purposes of the feasibility phase. A brief gross appraisal will follow format issued by Chief Appraiser.
- (3) For projects in which the value of real estate (lands, improvements, and severance damages) exceed 30 percent of total project costs (total cost to implement project), a full gross appraisal will be prepared in accordance with the appraisal regulation and guidance provided by EC 405-1-04 and the Chief Appraiser.

b. Attorney's Opinion of Compensability:

As described in paragraph 12-17 of Chapter 12, utility/facility relocations may require preliminary attorney's opinions of compensability. While the practice of obtaining preliminary attorney's opinions of compensability provides a high degree of certainty with regard to project costs during the feasibility phase, such opinions can be time consuming and may provide more certainty than may be optimal for feasibility purposes when potential utility/facility relocation costs do not constitute a large percentage of total project costs. In support of the goals set out in the new planning paradigm described in reference a., Districts shall adhere to the following guidance:

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- (1) Where the estimated total cost to modify all project utility facility relocations, including the value of any additional lands that may be required to perform the relocations does not exceed 30 percent of estimated total project costs, the District Office of Real Estate shall, in lieu of an attorney's opinion of compensability prepare a real estate assessment. Such a real estate assessment, will address the following questions:

- (a) Is the identified utility facility generally of the type eligible for compensation under the substitute facilities doctrine (e.g., school, highway, bridge, water and sewer systems, parks, etc.)
- (b) Does the District have some valid data or evidence that demonstrates that it has identified an owner with a compensable interest in the property

If the answer to both questions is yes, then the District Office of Real Estate shall reflect the cost of providing a substitute facility in the Real Estate Plan (REP) and all other feasibility study cost estimates. If the answer to either or both questions is no, the District shall not reflect the cost of a substitute facility in the REP or other feasibility study cost estimates. However, the REP narrative should still include a discussion on the facility with results of analysis and project impact. For cost shared projects, the non-federal sponsor must be advised that the inclusion of substitute facilities costs in the REP or other use feasibility study estimates is for planning and budgeting purposes only and does not constitute a preliminary or final determination of compensability by the agency regardless of whether the cost of substitute facilities are reflected in the feasibility study documents. Using a real estate assessment does not eliminate the need to obtain a final attorney's opinion of compensability prior to execution of the PPA.

- (2) Where the estimated total cost to modify all project facility relocations, including the value of any additional lands that may be required to perform the relocations, has public or political significance or the costs exceed 30 percent of estimated total project costs, a preliminary opinion of compensability shall be prepared for each owner's facilities. The level of documentation for each relocation item should be based on the significance of the relocation item to project formulation and estimated project costs.

Real Estate products, such as the REP, must be adaptable and scaled based on the project scope. Additionally, Real Estate must utilize the risk register to highlight areas where cost, schedule or uncertainty is greater in order to manage risk. Going forward, the Real Estate Division will continue to work closely with the Planning and Policy Division, Engineering and Construction Division, the Programs Integration Division and the National Law Firm on the Planning SmartGuide. This SmartGuide will provide more on procedures, tips, techniques and tools for


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specific types of planning projects to aid in implementation of the new Planning Paradigm. All
bulletins and updates on the SmartGuide can be found at:
<http://planning.usace.army.mil/toolbox/>.

5. Duration. The policies stated herein will remain in effect until amended or rescinded by Policy
Memorandums, Policy Guidance Letters, Engineers Circulars or Engineer Regulations.

FOR THE COMMANDER:



SCOTT L. WHITEFORD
DIRECTOR OF REAL ESTATE

DISTRIBUTION:

COMMANDER,
GREAT LAKES AND OHIO RIVER DIVISION (CELRD-PDS-R)
MISSISSIPPI VALLEY DIVISION (CEMVD-TD-R)
NORTH ATLANTIC DIVISION (CENAD-PD-E)
NORTHWESTERN DIVISION (CENWD-PDS)
PACIFIC OCEAN DIVISION (CEPOD-RE)
SOUTH ATLANTIC DIVISION (CESAD-PDS-R)
SOUTH PACIFIC DIVISION (CESPD-ET-R)
SOUTHWESTERN DIVISION (CESWD-ET-R)

CF:

COMMANDER,
DETROIT DISTRICT (CELRE-RE)
HUNTINGTON DISTRICT (CELRH-RE)
LOUISVILLE DISTRICT (CELRL-RE)
NASHVILLE DISTRICT (CELRN-RE)
PITTSBURGH DISTRICT (CELRP-RE)
MEMPHIS DISTRICT (CEMVM-RE)
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BALTIMORE DISTRICT (CENAB-RE)
NEW ENGLAND DISTRICT (CENAE-RE)
NEW YORK DISTRICT (CENAN-RE)
NORFOLK DISTRICT (CENAO-RE)

EXHIBIT C - WAIVER LETTER FOR COMPENSABILITY FOR PUBLICALLY OWNED UTILITIES AND FACILITIES



REPLY TO
ATTENTION OF

DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT SECRETARY
CIVIL WORKS
108 ARMY PENTAGON
WASHINGTON DC 20310-0108
14 JUL 1998

*File: Common Elements
✓ copy - John B*

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Mr. F. I. Hodgkins
Executive Director
Sacramento Area Flood Control Agency
1007 7th Street, 5th Floor
Sacramento, California 95814-3407

Dear Mr. Hodgkins:


This letter is in response to your letters of April 28, 1998 and May 6, 1998, relating to a cost sharing issue associated with utility relocations required for construction of the Common Elements Project in Sacramento, California.

Generally, the Corps treats relocations as creditable items of non-Federal work and includes such costs in total project costs. The exception is when the sponsor has the authority to compel relocations at no cost to the sponsor. Here, however, the authorizing documentation refers to both the State of California and the Sacramento Area Flood Control Agency (SAFCA) as the project sponsors. Requiring the State to revoke permits issued to SAFCA's member agencies would recognize neither the highly interrelated sponsorship of the project that includes the State, SAFCA, and SAFCA's constituent members, nor equitably reflect the joint contributions of these municipalities are making to project financing. Accordingly, we have determined that the removal and replacement of a utility, or other public facility, owned by the State of California, or a political subdivision thereof, and which delivers public services, should be treated as a relocation where such work is required as a direct result of the construction of the project. The Corps will include the costs incurred by the State in performing these relocations as part of shared total project costs and credit the State for such costs.

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The Army Corps of Engineers has drafted modifications to the Project Cooperation Agreement for the Common Elements Project implementing this determination. These modifications and implementation guidance have been provided to the Sacramento District for coordination with the State of California and SAFCA.

Sincerely,



Joseph W. Westphal
Assistant Secretary of the Army
(Civil Works)